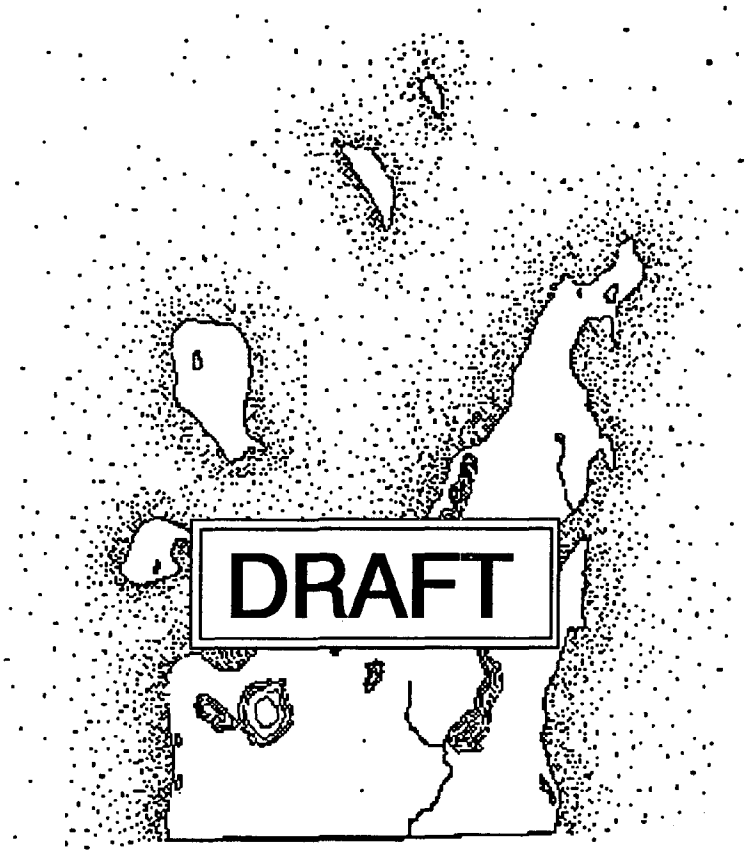
TRANSPORTATION, PUBLIC FACILITIES, AND PHYSICAL SERVICES



THE LEELANAU GENERAL PLAN

Policy Guidelines for Managing Growth on the Leelanau Peninsula

Working Paper Number 8

May 7, 1992

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Working Paper #8

TRANSPORTATION, PUBLIC FACILITIES, AND PHYSICAL SERVICES ON THE LEELANAU PENINSULA

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HB3525.M5 1992

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PREFACE

This working paper is the eighth in a series providing background information for the preparation of the **Leelanau General Plan: Policy Guidelines for Managing Growth on the Leelanau Peninsula**. The first four working papers were generated to document public input from county-wide growth management forums, the results of citizen and local officials surveys, and the activities of the Citizens Advisory Committee (CAC). This committee studied the need for a new County plan and various approaches that could be taken in the preparation of such a plan. They concluded that while a new plan was needed, it should not be simply another *"County Comprehensive Plan"* prepared by the County Planning Commission. Instead, what is needed is a growth management plan for the Peninsula that involves the direct input and participation of all the local units of government in the County. This led to the initiation of the **Leelanau General Plan.**

The fifth working paper presented a report on the *"Trend Future"* facing Leelanau County. Working paper #6 presents goals and objectives for the **General Plan.** The seventh working paper presents information and analysis on the economy of the Peninsula.

This working paper addresses the public facilities and physical services in the Leelanau Peninsula through the following chapters:

Chapter 1 - **Public Facilities and Physical Services provided by Local Municipalities.** This chapter discusses the public facilities and physical services provided by individual municipalities in the Peninsula including public sewer and water systems, recreation services, administrative offices, and other locally administered services and facilities.

Chapter 2 - **Public Facilities and Physical Services provided by Leelanau County.** This chapter discusses the public facilities and physical services provided by Leelanau County governmental agencies.

Chapter 3 - **County Transportation.** This chapter discusses the County's roadway network. It examines existing and projected conditions and service levels. Also discussed are transit facilities and non-vehicular facilities including bike paths and pedestrian circulation systems.

Chapter 4 - **Schools.** Public and private school facilities are reviewed including current enrollment and maximum capacities.

Chapter 5 - **Nonmunicipal Public Services.** This chapter reviews the many community services provided to the public by nonmunicipal bodies including utility providers, communications services, and medical facilities and services.

Chapter 6 - **Solid Waste Management Facilities.** This chapter reviews the solid waste management services and facilities in the Peninsula.

Chapter 7 - **State and Federal Lands.** Over 28 square miles of lands within the Leelanau Peninsula are owned and administered by state and federal agencies. These public lands are the focus of this chapter.

EXECUTIVE SUMMARY

The purpose of this working paper is to provide an information base that becomes a point of reference for discussing transportation, public facilities, and physical services issues in Leelanau County. Data and analysis are furnished to help local officials make better decisions when planning and allocating resources for the improvement and expansion of the facilities and services.

Public facilities and services offered by local municipalities on the Peninsula principally include recreation, libraries, cemeteries, public sanitary sewer and water, storm sewer, fire protection, and government administration. However, the vast majority of the local municipalities do not provide all of these services nor the majority of them. Only a few of the municipalities provide public sanitary sewer, water, and stormwater systems.

The levels of service provided by municipalities reasonably meet generally accepted standards for the delivery of such services. The greatest challenge to nearly all of the local municipalities is the dispersed population and settlement pattern, and the topographic and lake features of the Peninsula. These social and natural conditions impede cost-effective services and quick response times in emergency situations, and their impact can be expected to worsen as growth and development continue.

Public facilities and services provided by the Leelanau County government are limited to government administration, police protection, and recreation. These services can be considered to be at acceptable levels although future growth and development may well strain any effectiveness of existing facilties and allocated resources. The Leelanau County Road Commission maintains nearly all of the road mileage in the County. Though the majority of the road segments operate at acceptable levels, key segments are characterized by less than adequate construction standards, congestion, and public safety hazards.

There are numerous facilities and services provided to Peninsula residents and visitors by nonmunicipal entities including communications, electricity and gas utilities, and health facilities.

ITEMS FOR DISCUSSION

Following are items for further discussion related to each of the public facility/physical services addressed in this report.

PUBLIC FACILITIES & PHYSICAL SERVICES PROVIDED BY LOCAL MUNICIPALITIES

- The location of future growth and development should be based upon an intent to minimize increased public service costs due to excessively dispersed populations and limited available facilities.
- The location of future growth and development should be based upon an intent to maximize the utility of and investment in existing public services, particularly in Villages.
- The intensity and density of future development should be linked to the necessity for, and availability of, public services to protect public health and safety, including, where necessary, sanitary sewer, water, and fire protection.
- Areas should not be planned or zoned for high intensity or density of development if the infrastructure and support services are not currently present or specifically programmed for these areas, and unless such new service areas are considered to be in the best interest of the Peninsula as a whole.
- The timing and location of future growth and development should be directly linked to the assurance of adequate

services to accommodate this growth and development.

- The planned expansion and growth of existing urban areas and/or the establishment of new future population centers should be accompanied by the acquisition and preservation of certain lands for public use to assure the necessary land resources to provide local public facilities and services.
- A local recreation program should be developed to assure the provision of park and recreation opportunities in association with existing and future local residential development.
- Local strategies for the delivery of public services and provision of public facilities in association with the existing and future development should recognize the natural features of the Peninsula which impact the efficient delivery of services, including topography and water bodies.
- Communities should develop local level of service standards to guide future decisions on expansion or improvement of public facilities and to gauge the impact of new development proposals.
- Communities should develop local capital improvement programs consistent with both local comprehensive land use plans and the **Leelanau General Plan** to guide future capital facility investment decisions.

PUBLIC FACILITIES & PHYSICAL SERVICES PROVIDED BY LEELANAU COUNTY

- Future land use and growth and the administration of County activities and services should be strongly linked to better assure efficiency of operations, proximity to critical service areas, improved accessibility, visibility and communication with the general public.
- Consideration should be given to the most appropriate location for the County seat based upon the geographic locations of future planned land uses and the delivery of County services.
- The County should establish a long range plan for County administration facilities and develop an implementation program. The long range plan should recognize that future County services may extend beyond the current scope of services provided.
- A County-wide recreation program should be developed in conjunction with local units of government to identify current Peninsula-wide recreation needs, identify what the County's role should be in addressing these needs, and establish specific strategies to fulfill its role and provide the necessary facilities.
- Future police protection should be linked to satellite stations in principal population areas to better assure quick response times, visibility in, and communication with, local municipalities and affected citizens.
- Future locations of police protection facilities should be linked to principal transportation corridors and strategically positioned to avoid impassable barriers, including Lake Leelanau.

TRANSPORTATION

- The location of future growth and development should be directly linked to roadway corridors designed to accommodate the anticipated increase in demand, or linked to capital improvements intended to upgrade those road segments not capable of adequately accommodating the increased demands.
- Right of way preservation measures should be implemented to better enable future roadway expansions at a lower public cost.
- Future land use and development patterns should critically link road function characteristics to safe access.
- Improvements to the roadway network, in the form of new road segments,

should be considered to provide more efficient movement throughout the Peninsula.

- Access along principal thoroughfares should be more effectively regulated to minimize opportunities for congestion and safety hazards.
- All future new County or State operated roads should be designed and constructed to accommodate safe and functional bicycle transportation.
- Improvements to the roadway network, in the form of reconstructed and/or realigned intersections, should be considered to provide more efficient movement throughout the Peninsula.
- Improvements to the existing roadway network through general maintenance and reconstruction, should be considered to provide more efficient movement throughout the Peninsula. Future expenditures and capital improvement planning should recognize the long term need to improve the roadway base conditions of M-22 and M-72.
- Improvements to the roadway network, in the form of new road segments, should be considered to accommodate a portion of the demand currently placed upon M-22.
- Some new roads will be necessary to provide more direct alternative routes in certain areas such as completion of a proposed segment between Bugai Road and Mann Road in Elmwood Township.

SCHOOLS

- Future planned growth and development patterns must be linked to the need, ability, and schedule of area school districts to implement facility renovations, expansions, and new facility construction to avoid excess enrollment demand and decreases in education quality, or alternatively higher taxes to fund new school facilities.
- The siting of future new school facilities should recognize the benefits of close-to-home facilities, including: 1) decreased bussing, traffic generation, and energy consumption; 2) increased sense of community; and 3) increased accessibility to school related community services, including recreation facilities.

Chapter 1

PUBLIC FACILITIES and PHYSICAL SERVICES provided by LOCAL MUNICIPALITIES

INTRODUCTION

This chapter reviews the public facilities and physical services provided by each of the 14 local municipalities in the Peninsula in the areas of recreation, cemeteries, libraries, sanitary sewer, potable water, storm sewer, fire protection, and other local facilities and services. It opens with a description of the characteristics of available facilities and services. An analysis follows which highlights those issues of special concern in regard to the development of alternative futures for the Peninsula.

Leelanau County is a peninsula composed of many small communities linked to one another. The individual communities have common needs for basic community services and facilities. Some of these services and facilities are critical to the fundamental welfare of local residents, such as fire protection. Other facilities and services, such as libraries and parks, are not as fundamentally critical but significantly heighten the quality of life experienced within the municipality. Maintenance and/or expansion of existing local services is directly related to available financial resources. Once expanded, the funds must be sufficient to maintain the facility and the service. New development can provide new revenues to help pay for new facilities. But if new development generates demand for more public services than its tax revenues pay for, then the existing community has to make up the difference. One of the most important reasons for managing growth relates to the fiscal implications of development. Additionally, new public facilities can encourage new development. If the growth inducing aspects of public facilities are not adequately considered, then the environment and taxpayer's pocketbooks can both be negatively impacted.

The provision of public facilities and services by local municipalities within the Peninsula is not extensive. Public sanitary sewer, water, and storm sewer are provided in only a few of the Peninsula's municipalities and even then, do not necessarily serve all areas of these communities. Less costly facilities and services, including recreation areas, libraries, and cemeteries, are more prevalent. The most common facilities and services, in descending order of occurrence are: recreation facilities, local government offices, cemeteries, libraries, potable water, sanitary sewer, and storm sewer. Approximately half of the municipalities provide only two of the above physical services. An overview of locally available facilities and services is presented in Table 1-1.

Table 1-1*
Municipal Public Facilities and Services

	Bingham	Centerville Twp	Cleveland Twp	Elmwood Twp	Empire Twp	Empire Village	Glen Arbor Twp	Kasson Twp	Leelanau Twp	Leland Twp	Northport	Solon Twp	Suttons Bay Twp	Suttons Bay Village
RECREATION SERVICES	**YES**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**	**NO**	**YES**
# of Facilities	2	1	1	2		2	3		5	9	2	1		5
Acreage Range	less than 1	1	2	3-15		4-8	1 or less		1/2-72	1-100	2-3	20		5-30
Total Acreage	less than 1	1	2	18		12	1		124	111	5	20		68
General Conditions	G		G	G		G	G		G	G	G	G		G
Sports Fields				X		X			X	X		X		X
Tennis Courts				X						X	X	X		X
Basketball Courts							X			X	X			X
Playgrounds	X			X		X	X		X	X	X	X		X
Tot Lots						X			X		X	X		X
Picnicking	X	X	X	X					X	X	X	X		X
Trails/X-skiing						X				X				X
Beach/Swimming						X	X		X	X	X			X
Boat Ramp		X	X							X	X	X		
Marina/# Slips				Buoys						47	118			135
Sledding/Skating									X	X				X
LIBRARY SERVICES	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**	**YES**	**NO**	**NO**	**NO**	**YES**
# of Facilities						2			1	1				1
Year Constructed						?			1968	1976				1984
# Volumes						16000			25600	24000				12331
# Cardholders						2432			2100	2000				2699
# 1990 Circulation						9040			23535	38000				22995
CEMETERY SERVICES	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**NO**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**
# of Facilities	1		2		3			1	2	2		1	1	
SANITARY SEWER	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**UC**	**NO**	**NO**	**NO**	**YES**
Year Installed				1976										1934
POTABLE WATER	**NO**	**NO**	**NO**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**
Year Installed				?		1895					1930's			1908
STORM SEWER	**NO**	**NO**	**NO**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**P**
Year Installed (or to be installed)				?		1953					1930-40's			1993
FIRE PROTECTION	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Fire/Emergency Station	X			X		X	X		X	X	X	X		X
OTHER SERVICES	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO**	**NO**	**YES**
Municipal Offices Center			X	X	X	X	X	X	X		X			X
Maintenance/Garage Facility						X					X			X
Airport									X					

*G=Good P=Proposed UC=UnderConstruction

PUBLIC FACILITIES AND PHYSICAL SERVICES

Recreation

Of the 14 villages and townships in the Peninsula, three provide no significant recreation facilities; Empire Township, Kasson Township, and Suttons Bay Township. The balance of the municipalities operate one or more recreation facilities, although only three of the municipalities operate more than two such facilities. Glen Arbor Township operates three recreation facilities, all of which are one acre or less in size. Leelanau Township and the Village of Suttons Bay each operate five facilities for a total recreation acreage of 124 and 68 respectively, the largest acreages of the municipalities on the Peninsula. The five most common facilities offered by area municipalities within at least one of their park facilities include, in descending order of frequency, picnicking, playgrounds, sports fields, and beach/ swimming facilities. Nearly all of the facilities are considered to be in good condition, the largest of which, Woolsey Memorial Airport, is located in Leelanau Township and covers 72 acres.

In addition to the locally operated recreation facilities, and those of the County (to be discussed in Chapter 2), two major state and federal recreation facilities exist within the Peninsula. The federal government operates the Sleeping Bear Dunes National Lakeshore, a resource-based sand dune recreation area in excess of 25 square miles in area. The state operates the 1250 acre Leelanau State Park in the north region of the Peninsula and similarly provides resource-based recreation opportunities including camping, hiking, hunting, nature trails, fishing, swimming, and more.

Figure 1-1 illustrates the location of recreation facilities within the Peninsula.

Libraries

Four of the 14 municipalities on the Peninsula operate library facilities; these include the Villages of Empire and Suttons Bay, and the Townships of Leelanau and Leland. All of the library facilities maintained at least 12,000 volumes in 1990. Leelanau Township maintains the largest number of volumes at 25,000 and the highest circulation rate at approximately 23,500. While the Village of Empire's library facility was constructed in the early 1900's, all other facilities were constructed since 1968. The approximate size of each library facility is as follows:

- Glen Lake Community Library in Empire Village; 1,900 square feet
- Leelanau Township Library; 4,850 square feet
- Leland Library; 3,200 square feet
- Suttons Bay Village; 3,300 square feet.

The Glen Lake Community Library is jointly operated by the Village of Empire and Glen Arbor Township. In addition to their main library facility, these two communities also maintain a separate storage facility which houses an additional 4,000 of its 16,000 total volumes (see Figure 1-2).

Cemeteries

Eight of the 14 local municipalities in the Peninsula operate one or more cemetery facilities. Three of these communities operate two cemetery facilities and Empire Township is the only municipality that operates three such facilities (see Figure 1-2). In addition to the publicly operated cemeteries in the Peninsula, there are numerous cemeteries owned and operated by religious and Indian groups.

Sanitary Sewer

Two municipalities within the Peninsula currently operate public sanitary sewer systems: Elmwood Township and the Village of Suttons Bay. The Township of Leland is in the process of constructing a public sewer system at the time of this writing. It is expected to be operational in 1993. The overwhelming majority of homes and businesses in the County rely on private septic systems.

Elmwood Township: In 1976, Elmwood Township constructed a public sanitary

sewer system. The system is linked to the regional sewage treatment plant in Traverse City which provides both primary and secondary treatment and discharges into Boardman Lake. The Township's system has a daily maximum capacity of 8 million gpd and is currently operating at approximately 5 million gallons per day (gpd). Current peak demand is unknown. There are approximately 1000 hook-ups along the system, 850 of which are for residences, 90 for commercial establishments, and 60 for industrial facilities. Though no improvements are currently planned, the system is currently undergoing reassessment studies. Figure 1-3 illustrates Elmwood Township's sewer system.

Village of Suttons Bay: The Village of Suttons Bay public sanitary sewer system was initially constructed in 1934. The system uses secondary level treatment technology and discharges the treated sewage into Suttons Bay. The daily maximum capacity of the system is 38 million gpd and is currently operating at a peak demand of 19 million gpd. Since the system's construction, the Village has established eight lagoon cells; the three most recent become operational in 1988. The Village has been expanding the system's service area and intends to continue doing so during 1992 and 1993 at a total cost of approximately $275,000. The Village considers the system to be in excellent condition. The system services approximately 200 residences, 50 commercial establishments, and 5 industrial facilities. Figure 1-4 illustrates the Village of Suttons Bay sanitary sewer network.

Leland Township: Leland Township began construction on a municipal sanitary sewer system in the winter of 1991. Construction of the principal infrastructure system, including the lagoon facility, is expected to be completed by August 1. The next task will be making the individual hook-ups associated with residential and nonresidential structures to be serviced by the system. These hook-ups are expected to be in place by the end of 1992. The system is designed to accommodate approximately 35 million gpd. Initial services will be provided to approximately 600 households in Leland and Lake Leelanau, allowing for an additional 5 million gpd of flow for future expansion. Figure 1-5 illustrates the Leland Township sanitary sewer network.

Water Systems

Four public water systems provide service in limited areas of the Peninsula. All derive their water from wells like all other potable water users. None of the public systems treat the water prior to distribution.

Elmwood Township: Elmwood Township operates a small public water system in the west central area of the Township where several subdivisions have evolved (see Figure 1-6). The system was originally part of, and operated by, a subdivision development but was taken over by the Township in 1989 at which time it received improvements. The system receives its water from two underground wells and receives no treatment prior to distribution. The daily maximum capacity of the system is 40,000 gpd (average daily demand and current peak demand is unknown). A 4,000 gallon pressurized tank is used for storage purposes. Except for one commercial hook-up, all of the 100 hook-ups are for residences. No improvements are currently planned.

Village of Empire: The Village of Empire initially constructed a public water system in 1895. Today, the system is fed by groundwater from glacial deposits through three underground wells to provide a maximum capacity of 396,000 gpd. The system is currently characterized by a peak demand of 150,000 gpd and average daily demand of 70,000 gpd. A 100,000 gallon underground concrete tank provides water storage. Of the 261 hook-ups, 235 are for residences and 25 are for commercial establishments. The system serves approximately 354 persons and experiences a per capita demand of approximately 127 gpd. The system underwent ma-

jor renovations in 1981 and is considered to be in excellent condition. The Village has no further improvements planned at this time. Figure 1-7 illustrates the public water system of Empire Village including well sites.

Village of Northport: The Village of Northport operates a village-wide public water system that was initially constructed in the 1930's (see Figure 1-8). The system receives its water from two glacial deposit underground wells including a 100,000 gallon ground level storage tank. The average daily demand is approximately 77,160 gpd and the peak demand is approximately 81,300 gpd (daily maximum capacity is unknown). Approximately 610 persons are served by this system and it operates at a per capita rate of approximately 208 gpd. The system is considered to be in very good condition. Increasing the number of valves along the system is planned during the summer of 1992 and a new elevated storage tank is being considered.

Village of Suttons Bay: The Village of Suttons Bay public water system was initially constructed in 1908 and relies on two artesian wells, emanating from glacial drift, for its water source. The well water does not receive any treatment prior to entering the distribution network. The Village operates a 180,000 gallon ground storage reservoir and the system provides for a maximum peak demand of 150,000 gpd. The current average demand is approximately 130,000 gpd. Approximately 510 persons are served by the system and the system receives 138 gpd on a per capita basis. The Village has been extending the system's service area annually since 1989 and, except for a small extension planned for 1993 at a cost of approximately $22,000, the Village has no other current plans for significant future improvements or extensions. Of the total 242 hook-ups to the system, 190 are residential, 50 are commercial, and 2 are industrial. Figure 1-9 illustrates the Village of Suttons Bay public water system, including the location of its wells.

Storm Water Systems

Public storm systems are intended to collect runoff to limit the frequency of flood conditions, and filter out the runoff's impurities prior to discharge into a water body. Two municipalities in the Peninsula operate public storm sewer systems: the villages of Empire and Northport. The Village of Suttons Bay is anticipating the installation of storm sewer infrastructure by the end of 1993.

Village of Empire: A limited area of the Village of Empire is serviced by a public storm sewer system (see Figure 1-10). The system was constructed in 1953 and collects runoff primarily along Front Street via underground storm sewer and the runoff is discharged into a small stream which feeds into South Bar Lake. The Village does not employ retention or sedimentation basins. The system is considered to be in average condition and there are no major improvements currently planned. It is unknown what intensity of rainfall the Village's system is capable of adequately accommodating.

Village of Northport: The Village of Northport operates a public stormwater system in the downtown area of the Village. The system was constructed during the 1930's and 1940's. The system consists principally of several small independent storm pipes which discharge into nearby streams or directly into Northport Bay (see Figure 1-11). The Village does not employ retention or sedimentation basins. The storm sewer system is considered to be in fair condition and there are no current plans for expansions or improvements. It is unknown what intensity of rainfall the Village's system is capable of adequately accommodating.

Village of Suttons Bay: Though the Village of Suttons Bay does not currently operate a public stormwater system (MDOT operates a storm drain along M-22), the Village has plans to install a limited amount of stormwater infrastructure by the end of 1993 (see Figure 1-12). The system will discharge into a sedimentation basin adjacent to Suttons Bay. The system is expected to be de-

signed to accommodate the runoff from a rainfall intensity occurring at a frequency of once every ten years.

Fire & Emergency Medical Services

Eight local volunteer fire departments operate throughout the Peninsula (see Figure 1-13 for location of fire stations and service boundaries). These volunteer departments provide all of the fire protection services in the Peninsula except for periodic assistance the departments may secure from the Traverse City Fire Department in time of need. There are an equal number of departments administered by individual municipalities as there are departments administered through joint agreements between two or more local municipalities. The eight departments, and their respective geographic service areas, include:

1) Cedar Fire Department (Cedar, Centerville, and Kasson Township)
2) Elmwood Fire and Rescue Department (Elmwood Township)
3) Empire Fire and Rescue Department (Empire Township and Village of Empire)
4) Glen Arbor Fire and Rescue Department (Glen Arbor Township)
5) Leland Township Fire and Rescue Department (Leland Township)
6) Northport Fire Department (Village of Northport and Leelanau Township)
7) Northport Rescue (Village of Northport and Leelanau Township)
8) Suttons Bay-Bingham Fire and Rescue Department (Village of Suttons Bay and the Townships of Suttons Bay and Bingham).

Grand Traverse Emergency Medical Services operates as the primary transporting ambulance service in Elmwood Township. This arrangement is part of a contractual agreement between EMS and the Township. Elmwood Township's rescue unit is a nontransporting unit.

Northport Rescue provides ambulance services only, and is stationed at the Leelanau Memorial Hospital. The service is jointly funded by the Township and Hospital. The rescue service is operated independently of the Northport Fire Department.

Six of the eight departments operate a single facility. The Northport Fire Department operates facilities in both the Village of Northport and the community of Omena. The Suttons Bay-Bingham Fire and Rescue Department operates stations in both the Village and the southern limits of Bingham Township. Each of the departments' stations provide for the storage of equipment and vehicles. Each of the facilities has a training/meeting room and a kitchen. None of the facilities have sleeping quarters. The principal equipment and vehicles available throughout the Peninsula include:

- 11 pumpers, 500 to 1250 gallon capacity
- 5 mini-pumpers, 250 to 300 gallon capacity (predominantly)
- 12 tankers
- 6 equipment tanks
- 7 brush trucks
- 7 ambulances
- 5 rescue vans
- 1 cascade system
- 5 jaws-of-life
- 4 portable hydrants
- 4 stabilizer air bags.

Cumulatively, the fire departments have approximately 25,000 feet of hose ranging from 1 1/2 to 5 inches in diameter. Two or more fire departments are immediately dispatched in response to a fire alarm. In all, 1,048 emergency calls were received in the Peninsula by the fire departments during 1990, 392 of which were for fire emergency service and 656 were for ambulatory service.

The Insurance Service Organization rates municipal areas according to the available level of fire protection, for use by insurance companies. Fire ratings range from 1 to 10. While there are numerous criteria employed to establish a fire rating, a rating of 10 is the lowest rating and generally applies to areas which do not have an organized fire department. A rating of 9 is applied to those areas which are serviced by a fire department but

are not within five road miles of a fire station. All villages in the Peninsula have been given a rating of 7, except the Village of Empire, which has an 8 rating. Except for the Townships of Suttons Bay, Leland, and Elmwood, which have ratings of 8, nearly all other Township areas have a 9 rating. There are some limited areas which have been given a rating of 10.

There are four levels of training by which state certified emergency medical services personnel are classified according to the level of training they have successfully completed: ambulance attendant, Emergency Medical Technician (EMT), EMT-specialist, and Paramedic. Most volunteers in Leelanau County are ambulance attendants and EMT's, with a few EMT-specialists. In the most severe emergencies, paramedics from Traverse City are routinely called to assist, irrespective of the emergency location within the County. In addition, the North Flight medical team is available from Traverse City (helicopter transport). These services are frequently called upon in Leelanau County.

A detailed listing of fire equipment, by department, is provided in the Appendix.

Other Facilities and Services

Of the 14 local municipalities in the Peninsula, eight operate municipal offices which are open to the public at regularly scheduled hours, three operate maintenance/garage facilities, and one–Leelanau Township–operates a small airport. Four of the municipalities do not maintain municipal offices in the formal sense as local officials carry out their duties from their residences. These municipalities do maintain a facility for the purposes of holding meetings. Administrative activities are carried out within the residences of the local officials. Figure 1-14 shows the location of all Village and Township halls, as well as other municipal facilities.

EMERGING ISSUES

Public facilities and physical services provided by the local municipalities within the Peninsula are generally limited. Though the scope of these services are limited, the service levels currently provided reasonably meet generally accepted standards for the delivery of such services.

The generally accepted standard for local park acreage of 10 acres per 1,000 population is met by the vast majority of municipalities and is clearly met on a Peninsula-wide basis. Similarly, the American Library Association's standard of 2.5 volumes per capita for populations ranging in size from 10,000 to 35,000 persons is exceeded on a Peninsula wide basis. None of the municipalities are in need of additional public lands for cemetery purposes. The sanitary sewer and water systems in place within the more urbanized communities within the Peninsula are currently meeting the daily and peak demands placed upon them and most of the infrastructure is in good condition.

While the services provided by the local municipalities may generally meet these standards, it is important to note that the dispersed population pattern within the Peninsula raises questions regarding the effective accessibility of some of these services to the general public. Access to park and library facilities requires access to a vehicle and often involves a comparatively large driving time. This circumstance is exacerbated by the many months of winter weather in the Peninsula and the additional hardship it creates in accessing these facilities.

Fire protection is perhaps the most difficult service to provide by local municipalities within the Peninsula. The population is very dispersed and the circuitous road network hinders quick response times. There are numerous areas within the Peninsula which do not fall within the American Insurance Association's fire department standard–an optimum service radius of four miles where buildings are 100 feet or more apart. While the majority of residents living within the more urban areas of the Peninsula fall within such a radius, a substantial number of residents do not, nor would it be feasible to do so

with the dispersed population pattern across most of the Peninsula.

While the levels of service associated with the current public facilities and physical services provided by local municipalities are reasonable, these levels of service will be exceeded in the future. Though local park acreage on a Peninsula-wide basis exceeds the standard of 10 acres per 1,000 population by more than 100% (16,527 population and approximately 360 acres of local park land yields approximately 22 acres of local park land per 1,000 population), accessibility to these facilities will become a greater issue as population densities increase in the more outlying areas of the Peninsula where fewer park facilities are located.

The worsening condition of accessibility will similarly face fire protection and library services as well. The safety of the public will become increasingly jeopardized as current fire stations may find themselves increasingly distant from a rising number of new households. Library accessibility is further exacerbated by the fact that accepted volume standards will be threatened in fifteen years if the County continues to grow as it has since 1980, and the current library facilities are small with little excess capacity.

Existing public sewer and water systems in the Peninsula are generally considered to be in good condition and with available excess supplies within the system. The relatively limited growth experienced by those villages with such systems (excluding Elmwood Township) may support the viability of these systems well into the future if such limited growth rates continue. Of particular concern, however, is the rapid growth in some of the municipalities within the Peninsula that do not operate public sewer or water systems. If these locally high growth rates continue and the growth not appropriately guided and managed, there may well be several municipalities forced to construct such systems. Depending upon the future growth rates within the individual municipalities and the associated pattern of land development and land use, new and/or expanded stormwater management systems may become a necessity, despite the relatively high porosity of may local soils.

Anticipated future growth rates may well dictate more formal municipal offices, and staffing of the offices on a more regular (perhaps daily) basis, for many of the municipalities in the Peninsula. Increased growth and development will inevitably result in more intensive schedules for local legislative bodies, planning commissions, zoning and municipal administrators, and municipal staff. Municipal offices properly manned and equipped to accommodate administrative record keeping, questions and requests by the public, and similar day-to-day activities of growing communities will become an increasing need.

ITEMS FOR DISCUSSION

The limited extent of existing and planned local public facilities within the Peninsula, when compared to the sustained effect of current rates of growth, suggest the following:

1) The location of future growth and development should be based upon an intent to minimize increased public service costs due to excessively dispersed populations and limited available facilities.
2) The location of future growth and development should be based upon an intent to maximize the utility of and investment in existing service areas, particularly in Villages.
3) The intensity and density of future development should be linked to the necessity for, and availability of, public services to protect public health and safety, including, where necessary, sanitary sewer, water, and fire protection.
4) Areas should not be planned or zoned for high intensity or density of development if the infrastructure and support services are not currently present or specifically programmed for these areas, and unless such new service areas

are considered to be in the best interest of the Peninsula as a whole.

5) The timing and location of future growth and development should be directly linked to the assurance of adequate services to accommodate this growth and development.
6) The planned expansion and growth of existing urban areas and/or the establishment of new future population centers should be accompanied by the acquisition and preservation of certain lands for public use to assure the necessary land resources to provide local public facilities and services.
7) Local recreation programs should be developed to assure the provision of park and recreation opportunities in association with existing and future local residential development.
8) Local strategies for the delivery of public services and provision of public facilities in association with the existing and future development should recognize the natural features of the Peninsula which impact the efficient delivery of services, including topography and water bodies.
9) Communities should develop local level of service standards to guide future decisions on expansion or improvement of public facilities and to gauge the impact of new development proposals.
10) Communities should develop local capital improvement programs consistent with both local comprehensive land use plans and the **Leelanau General Plan** to guide future capital facility investment decisions.

Figure 1-1
RECREATION FACILITIES

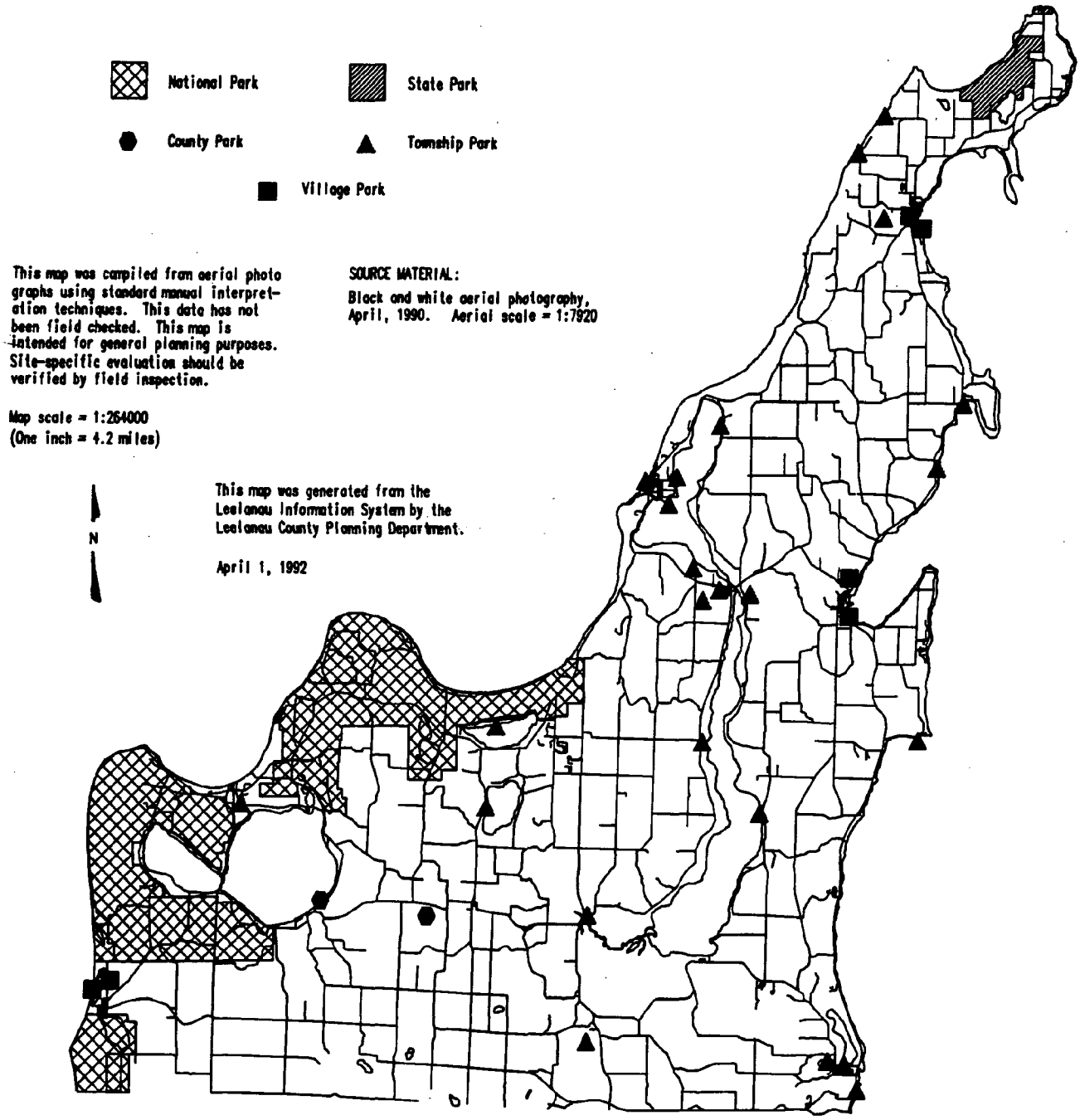


Figure 1-2
LIBRARY AND CEMETERY FACILITIES

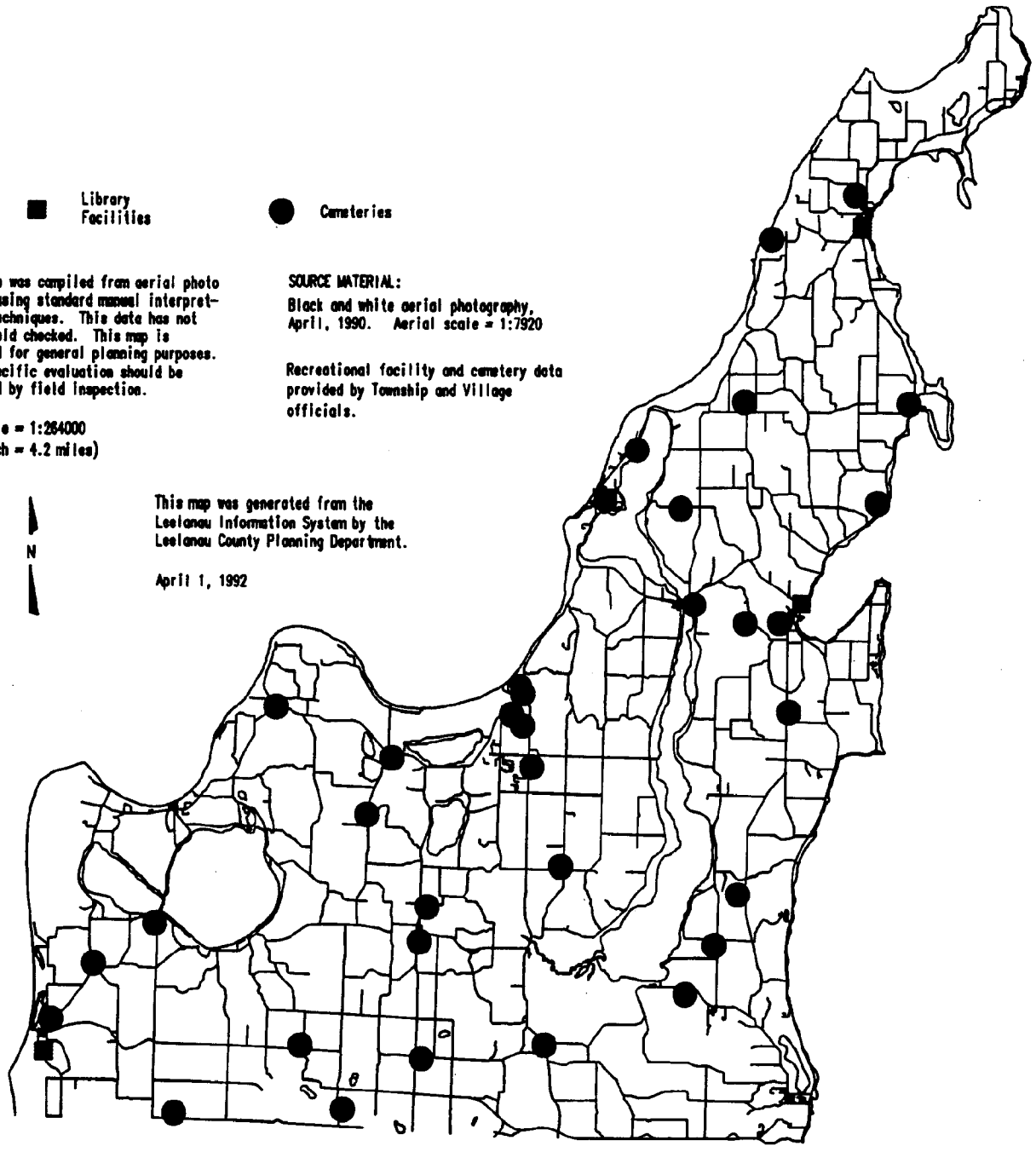
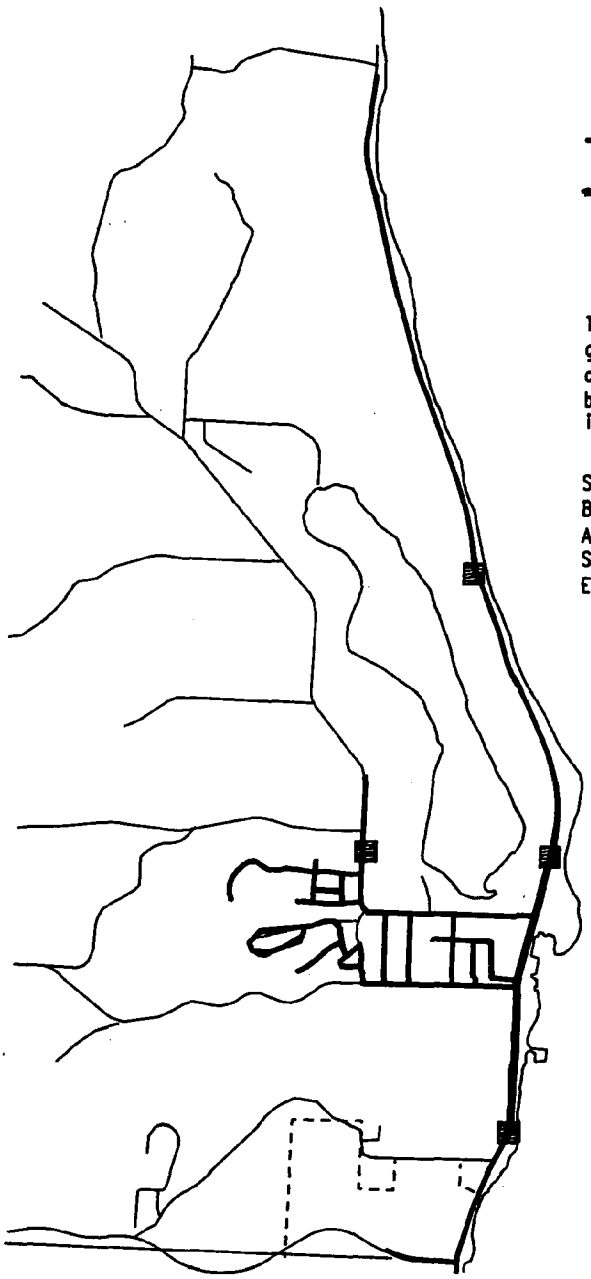


Figure 1-3
ELMWOOD TOWNSHIP SEWER SYSTEM



8" Main Lines

12" Main Lines

Dump Stations

This map was compiled from aerial photo graphs using standard manual interpret-ation techniques. This data has not been field checked. This map is intended for general planning purposes.

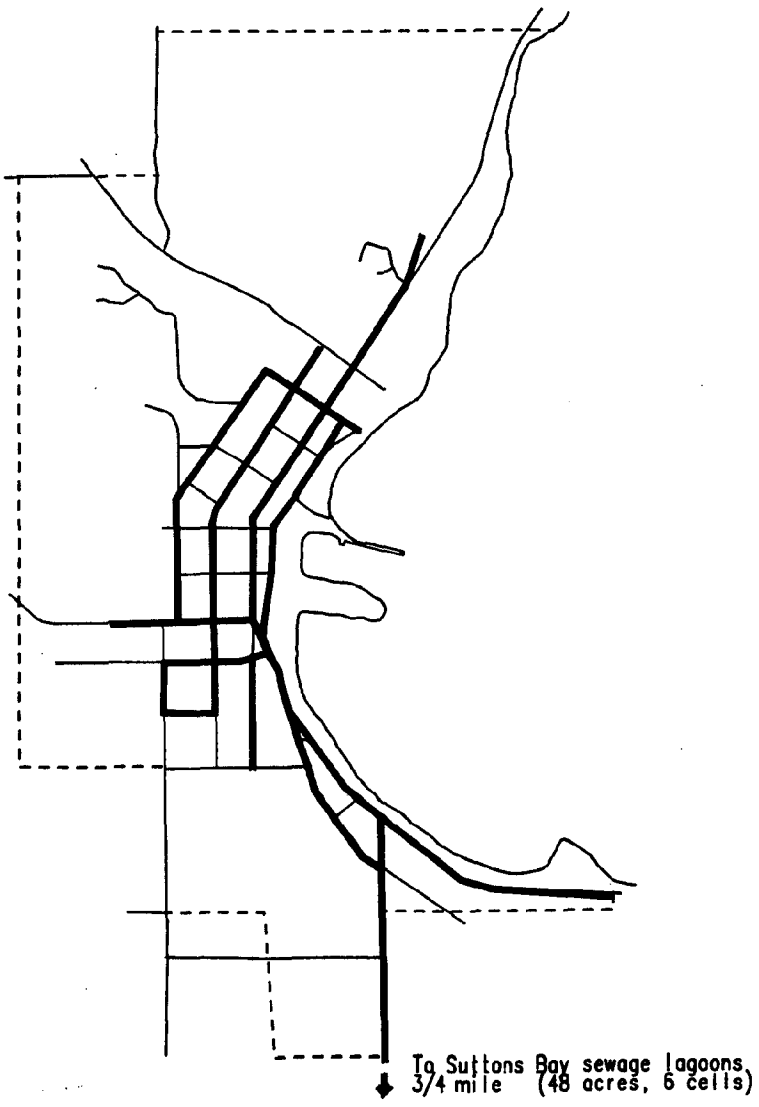
SOURCE MATERIAL:
Black and white aerial photography, April, 1990. Aerial scale = 1:7920
Sanitary sewer system data provided by Elmwood Township.

This map was generated from the Leelanau Information System by the Leelanau County Planning Department. April 1, 1990

Map Scale = 1:42240
(1" = app. 2/3 mile)

N

Figure 1-4
SUTTONS BAY SEWER SYSTEM



This map is compiled from aerial photographs using standard manual interpretation techniques. This map has not been field checked. This map is intended for general planning purposes.

Map scale = 1:15840
(One inch = 1/4 mile)

SOURCE MATERIAL:
Black and white aerial photography, April, 1990. Aerial scale = 1:7920

Sanitary sewer system data provided by the Village of Suttons Bay.

This map was generated from the Leelanau Inforamtion System by the Leelanau County Planning Department.

April 1, 1992

N

Figure 1-5a
LELAND TOWNSHIP SEWER SYSTEM
(LELAND PART)

Lift Station
Road
2" Line
4" Line
6" Line
8" Line
10" Line

This map was compiled from aerial photographs using standard manual interpretation techniques. This data has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:
Black and white aerial photography, April, 1990. Aerial scale = 1:7920
Sewer system data provided by Leland Township.

Map scale = 1:15840
(One inch = 1/4 mile)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department.

April 1, 1992

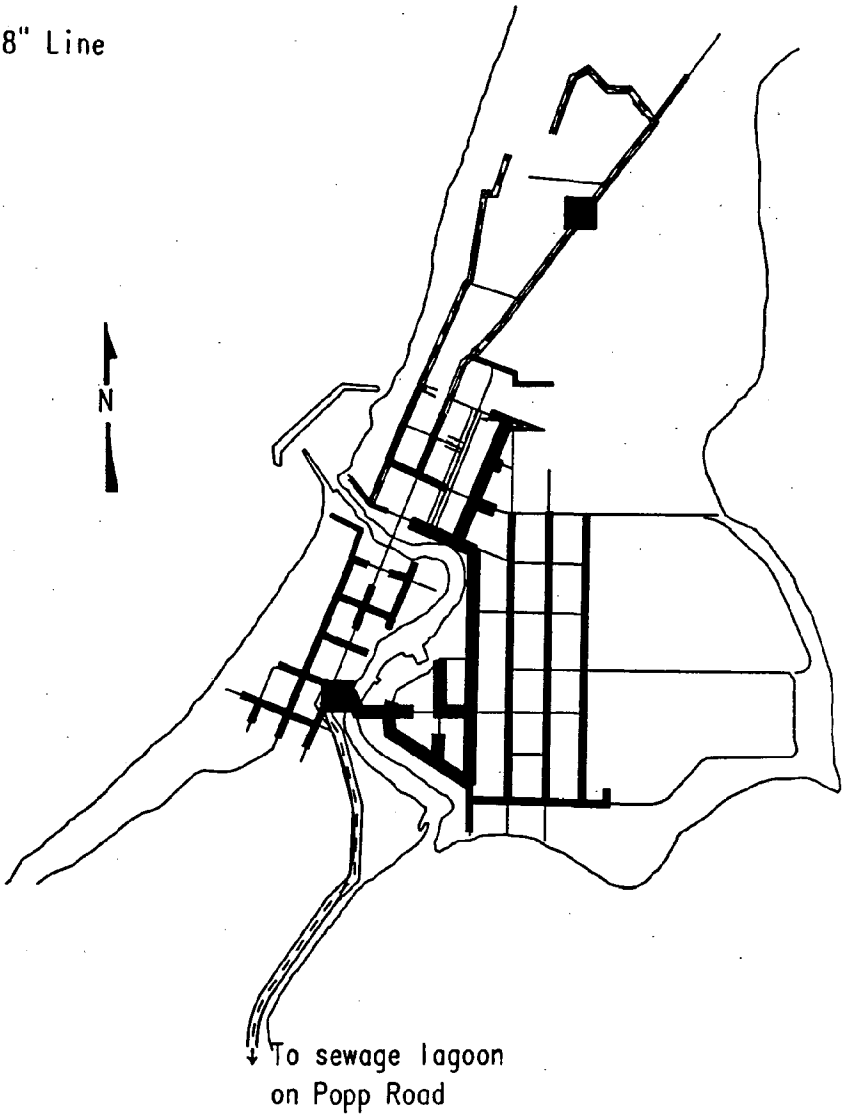


Figure 1-5b
LELAND TOWNSHIP SEWER SYSTEM
(LAKE LEELANAU PART)

Road

2" Line

4" Line

6" Line

8" Line

Lift Station

This map was compiled from aerial photographs using standard manual interpretation techniques. This map has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:

Black and white aerial photography, April, 1990. Aerial scale = 1:7920
Sanitary sewer data provided by Leland Township.

Map scale = 1:15840
(One inch = 1/4 mile)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department.

April 1, 1992

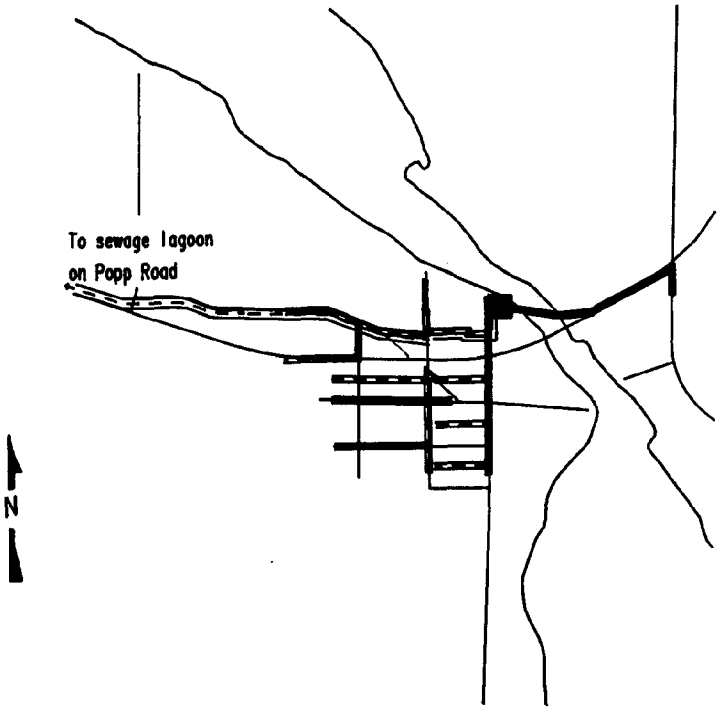


Figure 1-6
ELMWOOD TOWNSHIP WATER SYSTEM

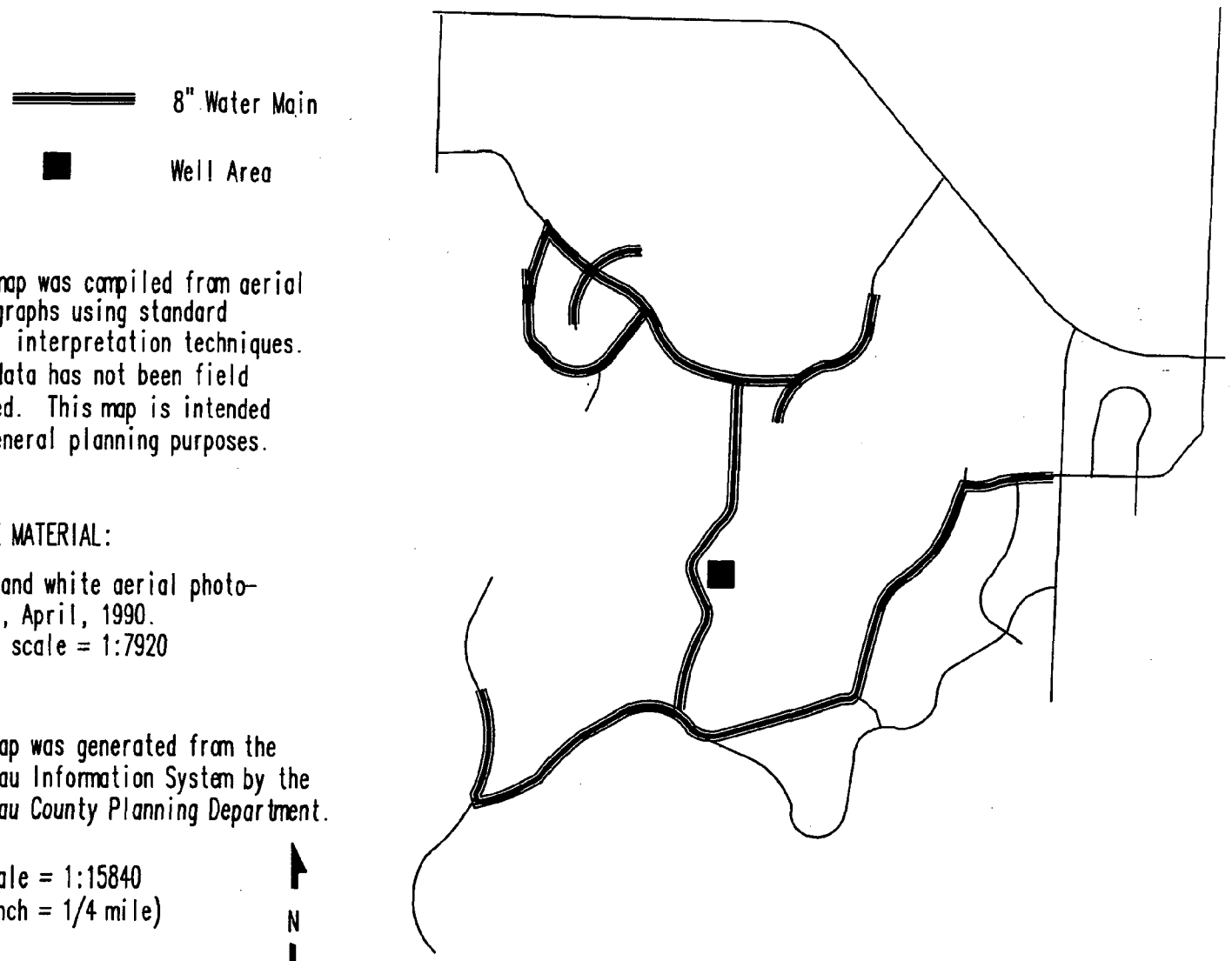


Figure 1-7
EMPIRE WATER SYSTEM

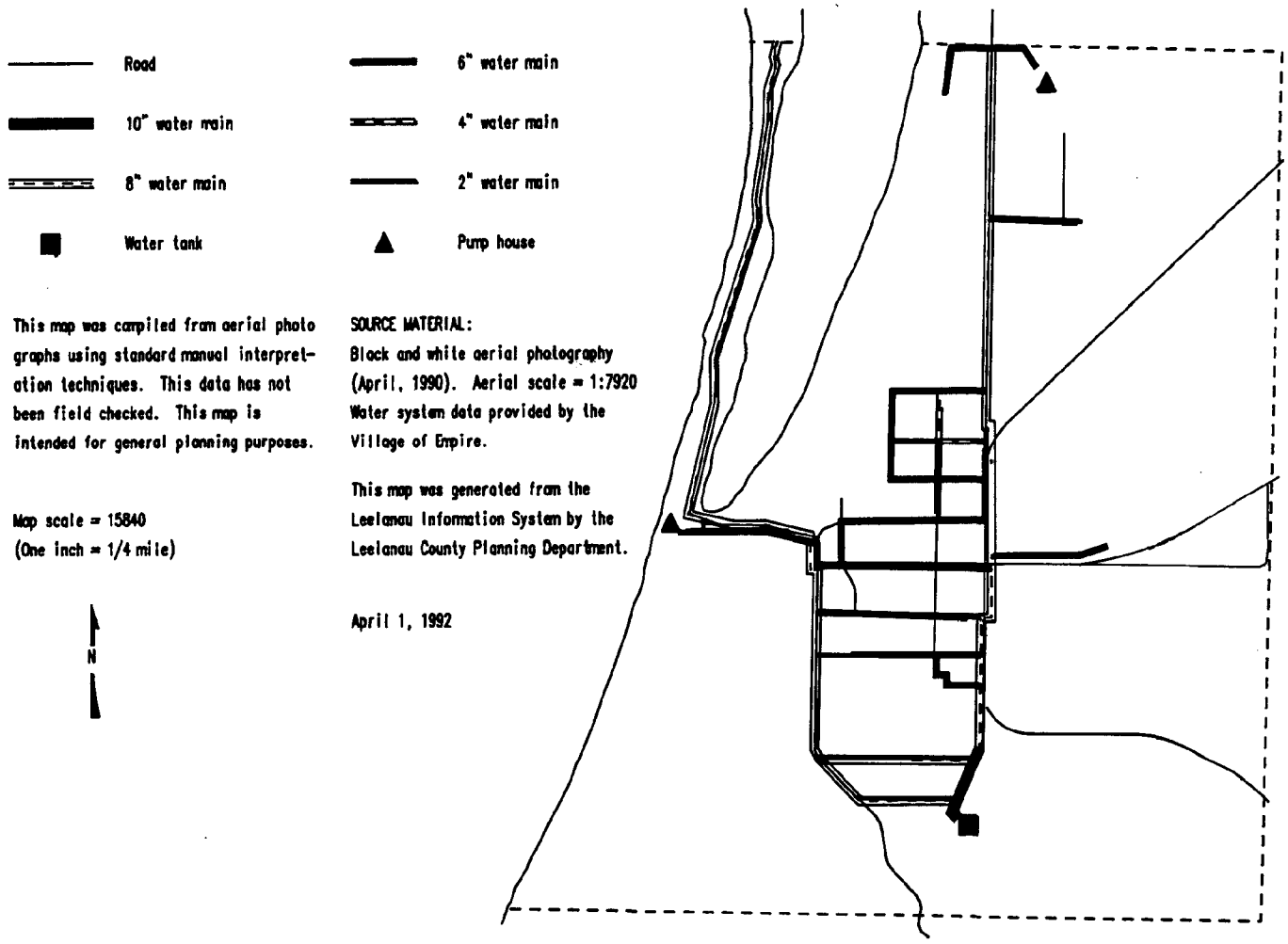


Figure 1-8
NORTHPORT WATER SYSTEM

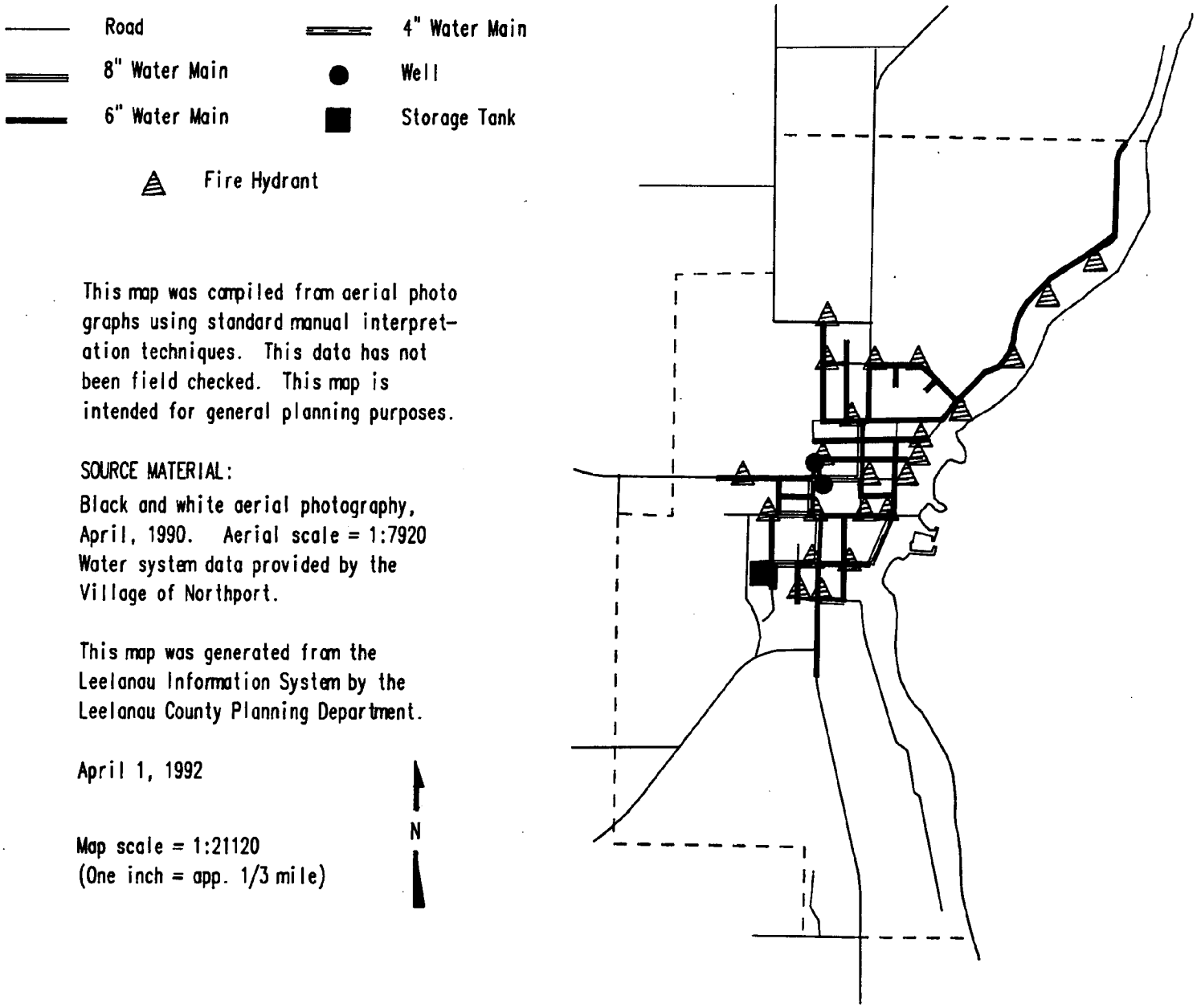


Figure 1-9
SUTTONS BAY WATER SYSTEM

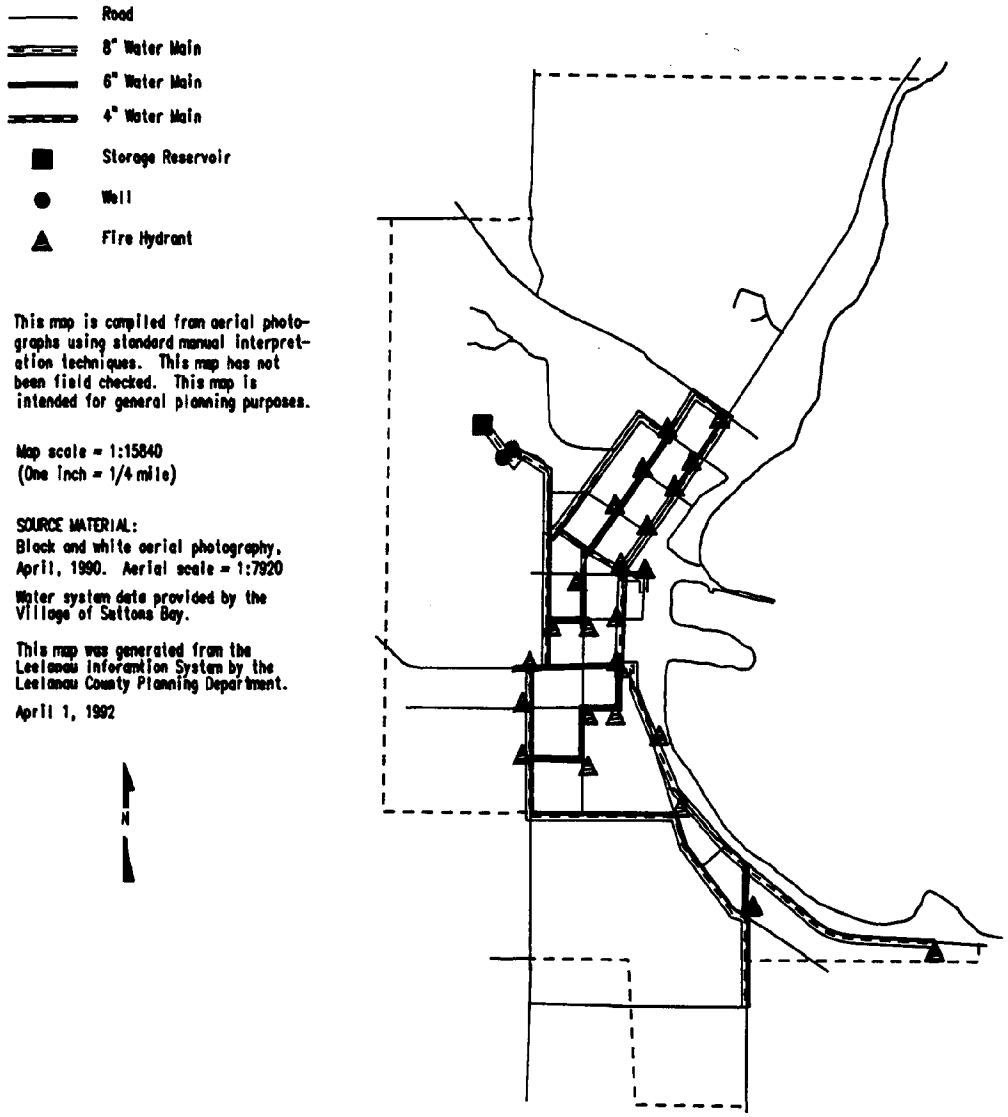


Figure 1-10
EMPIRE STORMWATER WATER SYSTEM

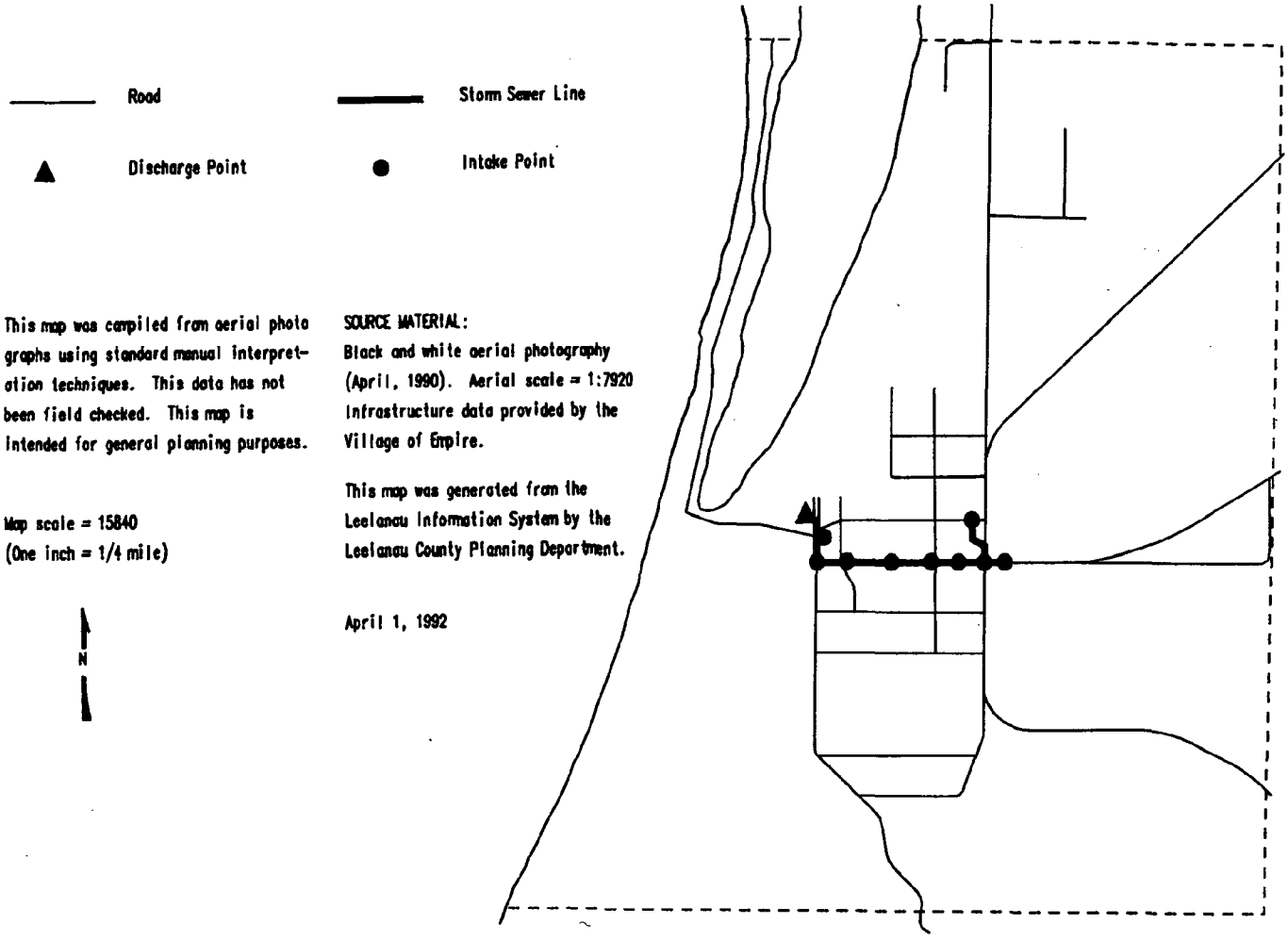
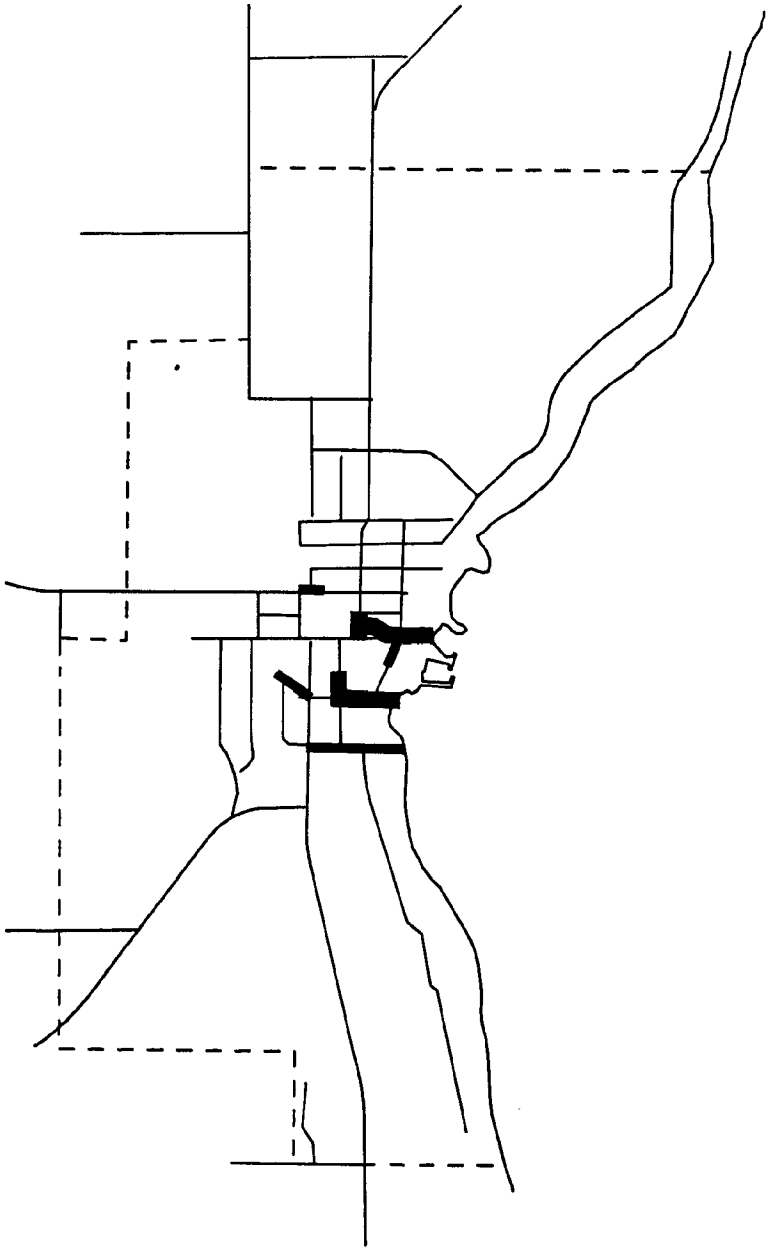


Figure 1-11
NORTHPORT STORMWATER SYSTEM

Road
18" Line
12" Line
4" Line



This map was compiled from aerial photo graphs using standard manual interpretation techniques. This data has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:
Black and white aerial photography, April, 1990. Aerial scale = 1:7920
Storm water system data provided by the Village of Northport.

This map was generated from the Leelanau Information System by the Leelanau County Planning Department.

April 1, 1992

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Map Scale = 1:21120
(One inch = app. 1/3 mile)

Figure 1-12
SUTTONS BAY STORMWATER SYSTEM

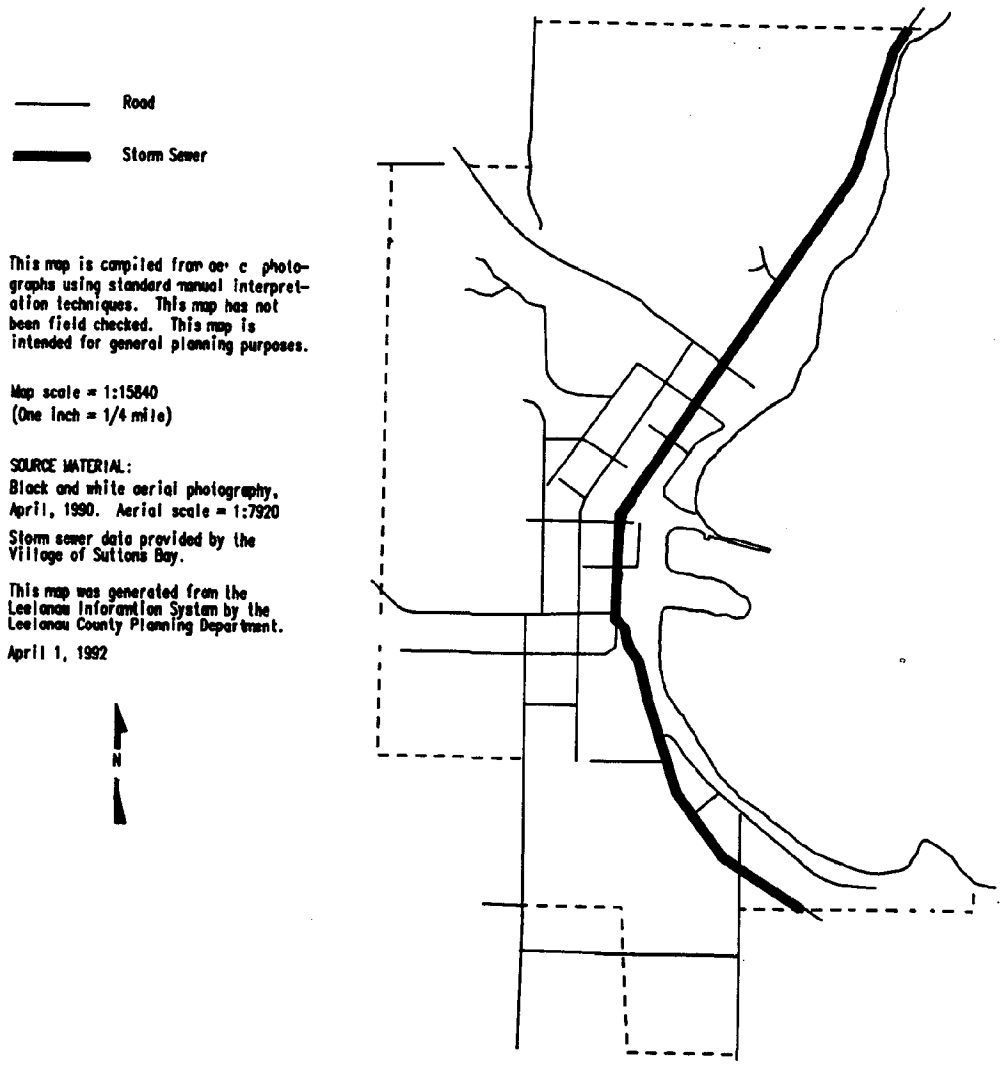

Figure 1-13a
CEDAR FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

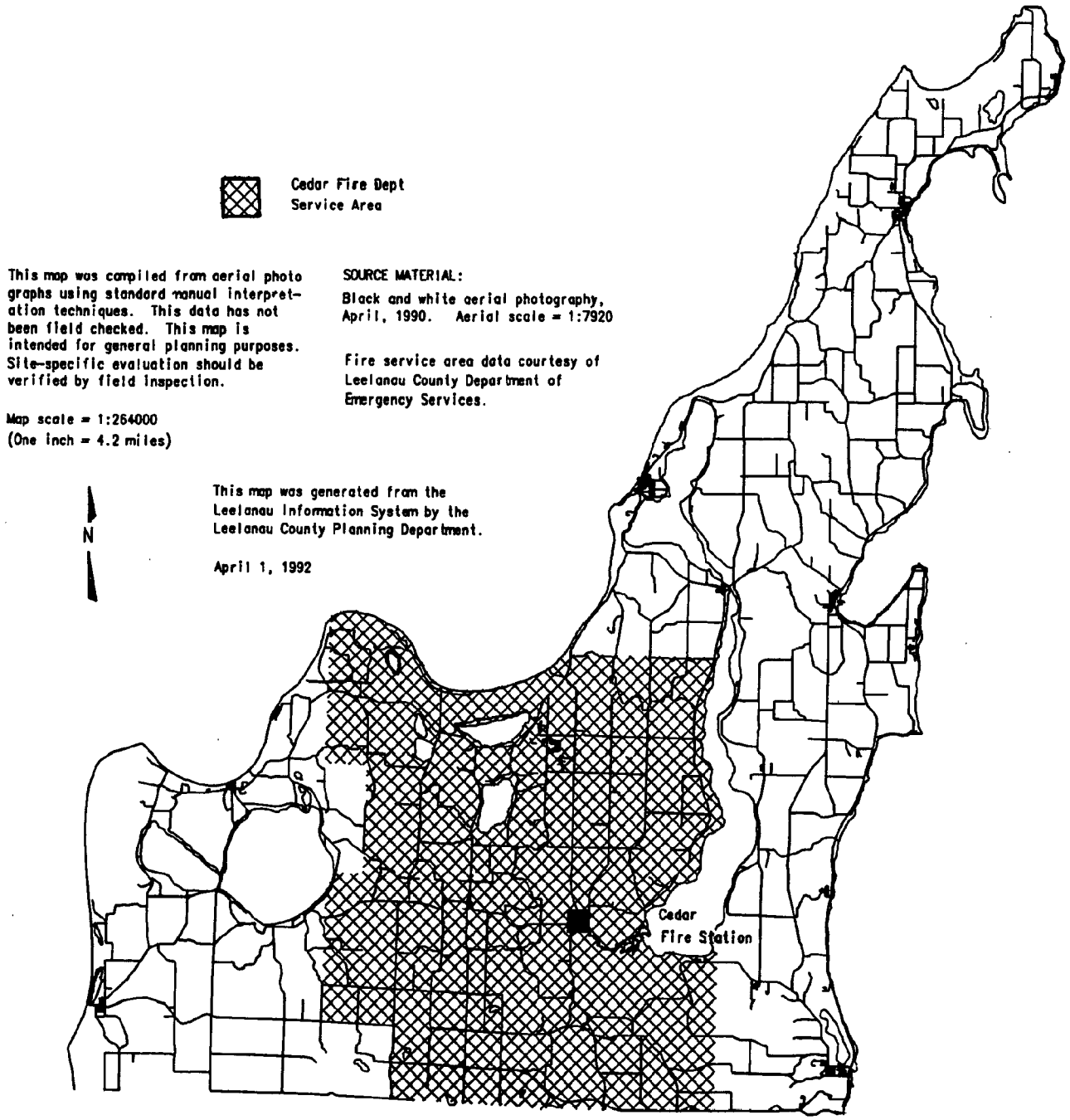

Figure 1-13b
ELMWOOD TOWNSHIP FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

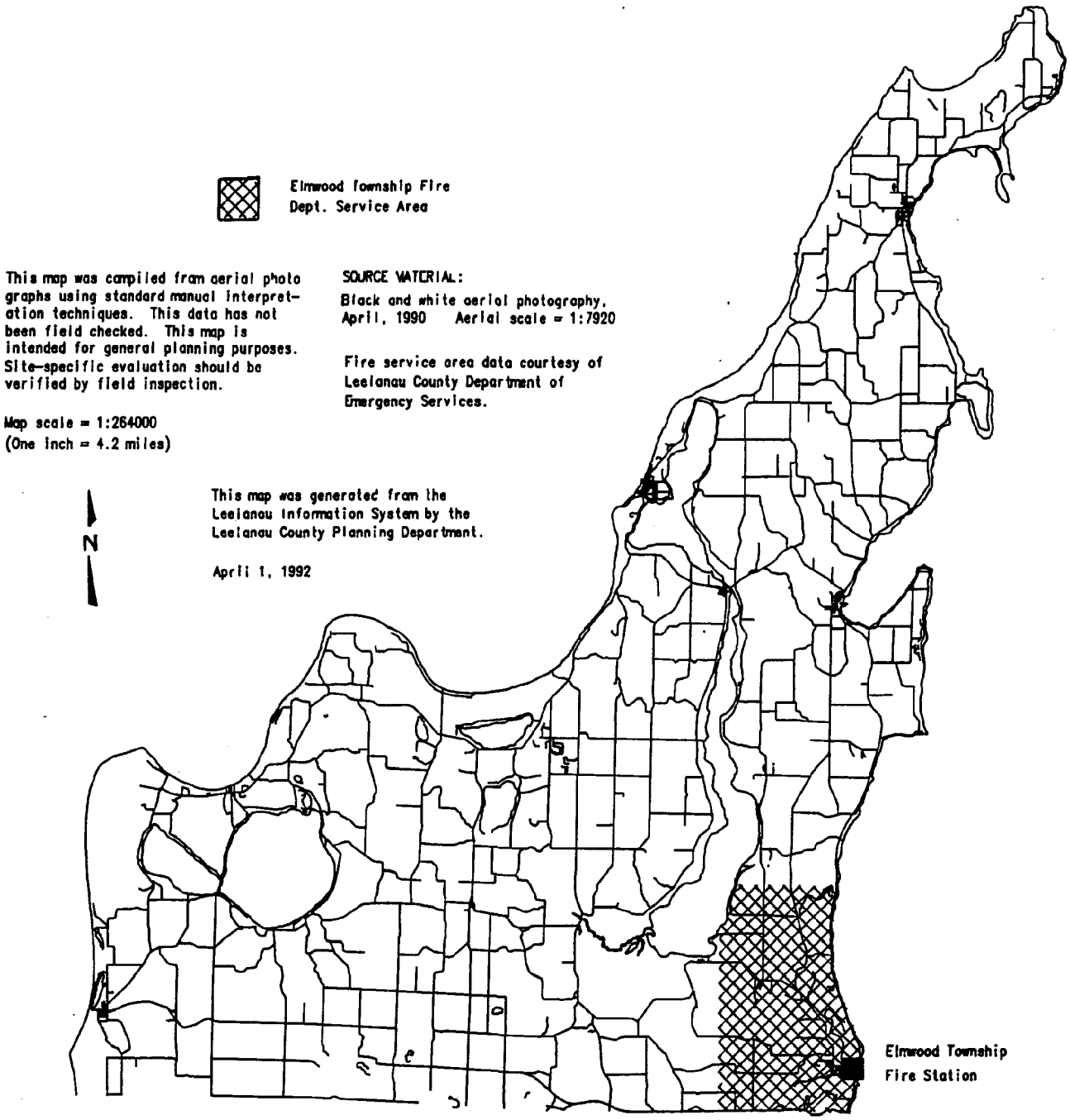

Figure 1-13c
EMPIRE FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

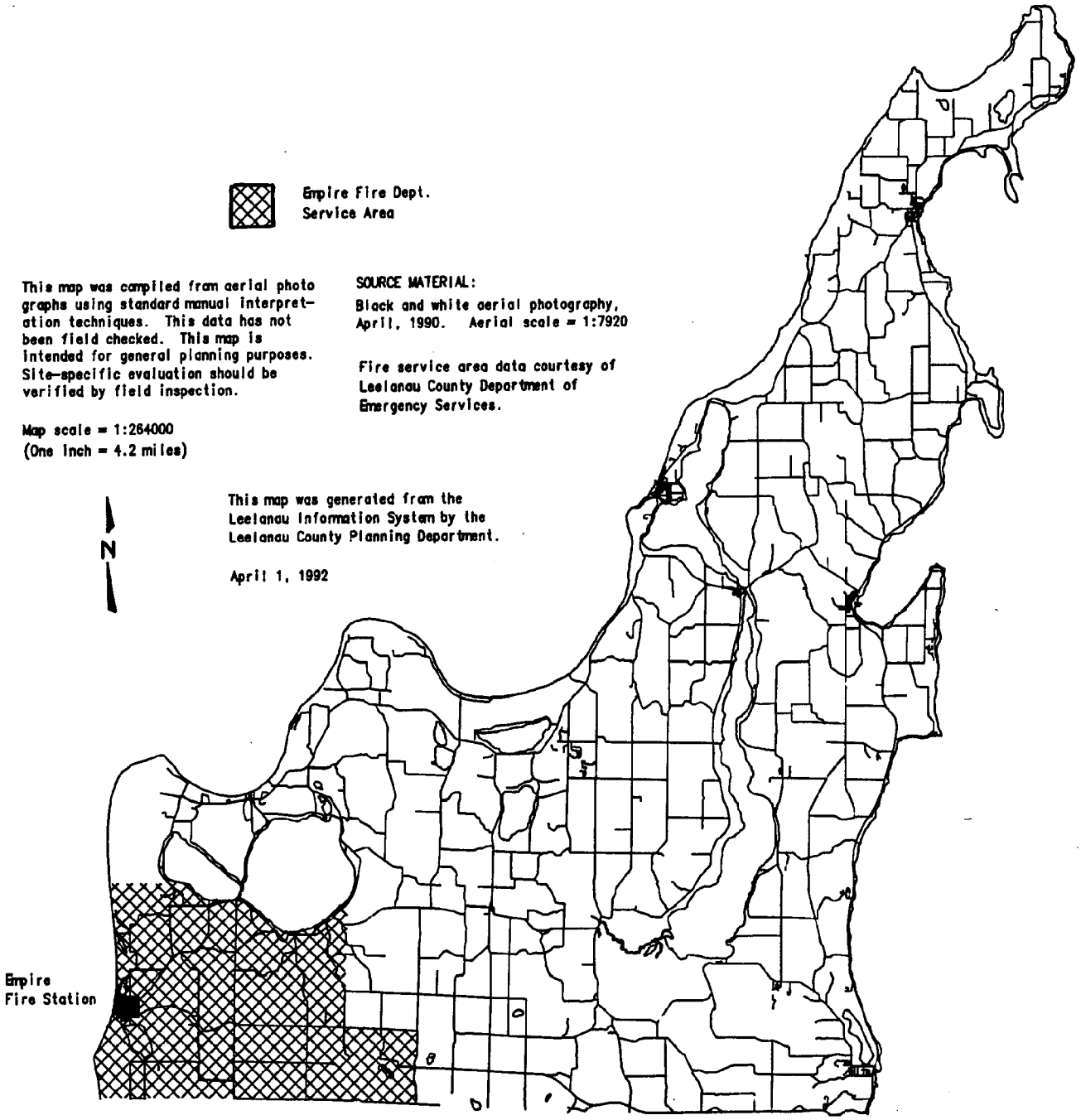

Figure 1-13d
GLEN ARBOR FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

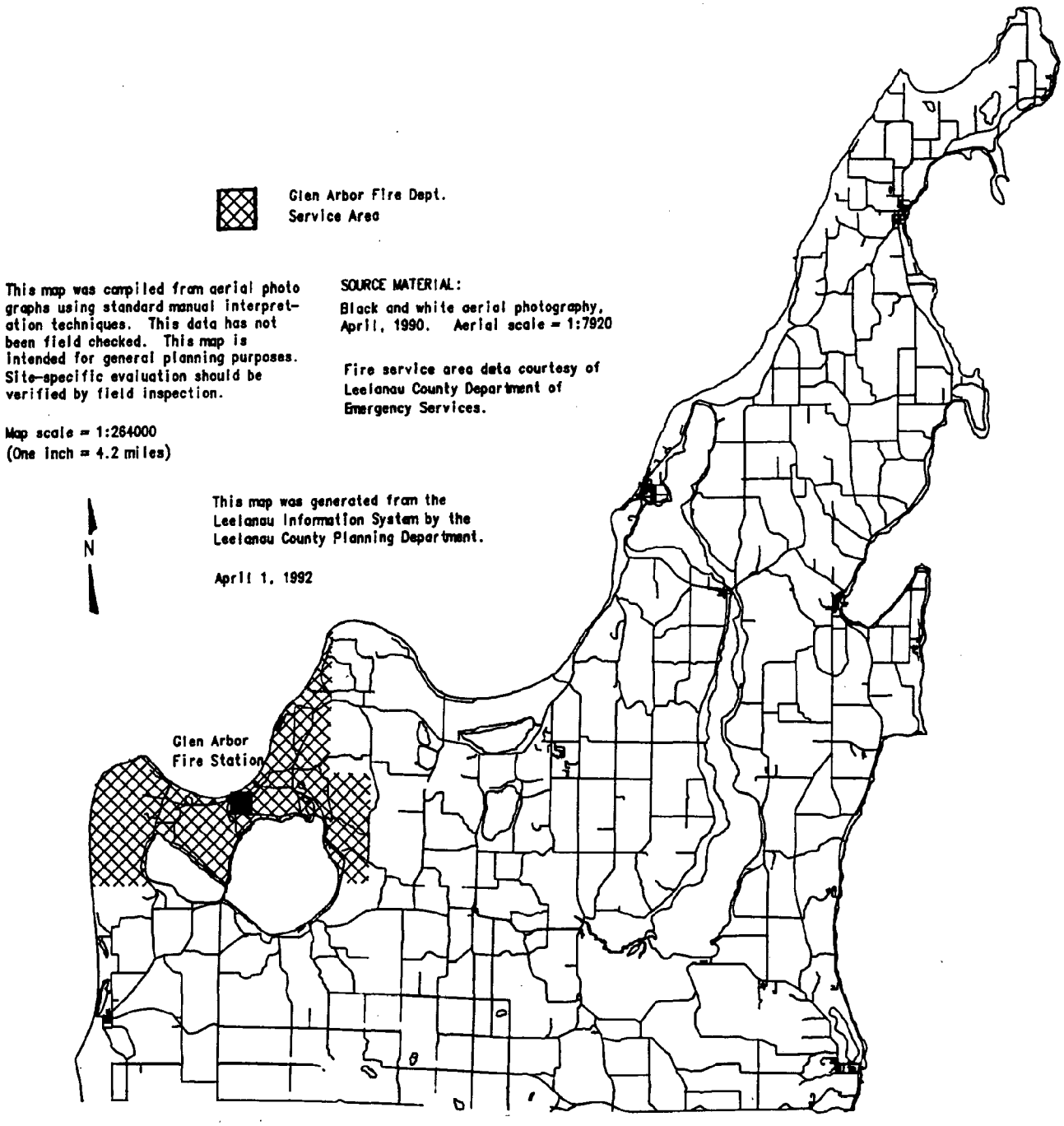

Figure 1-13e
LELAND TOWNSHIP FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

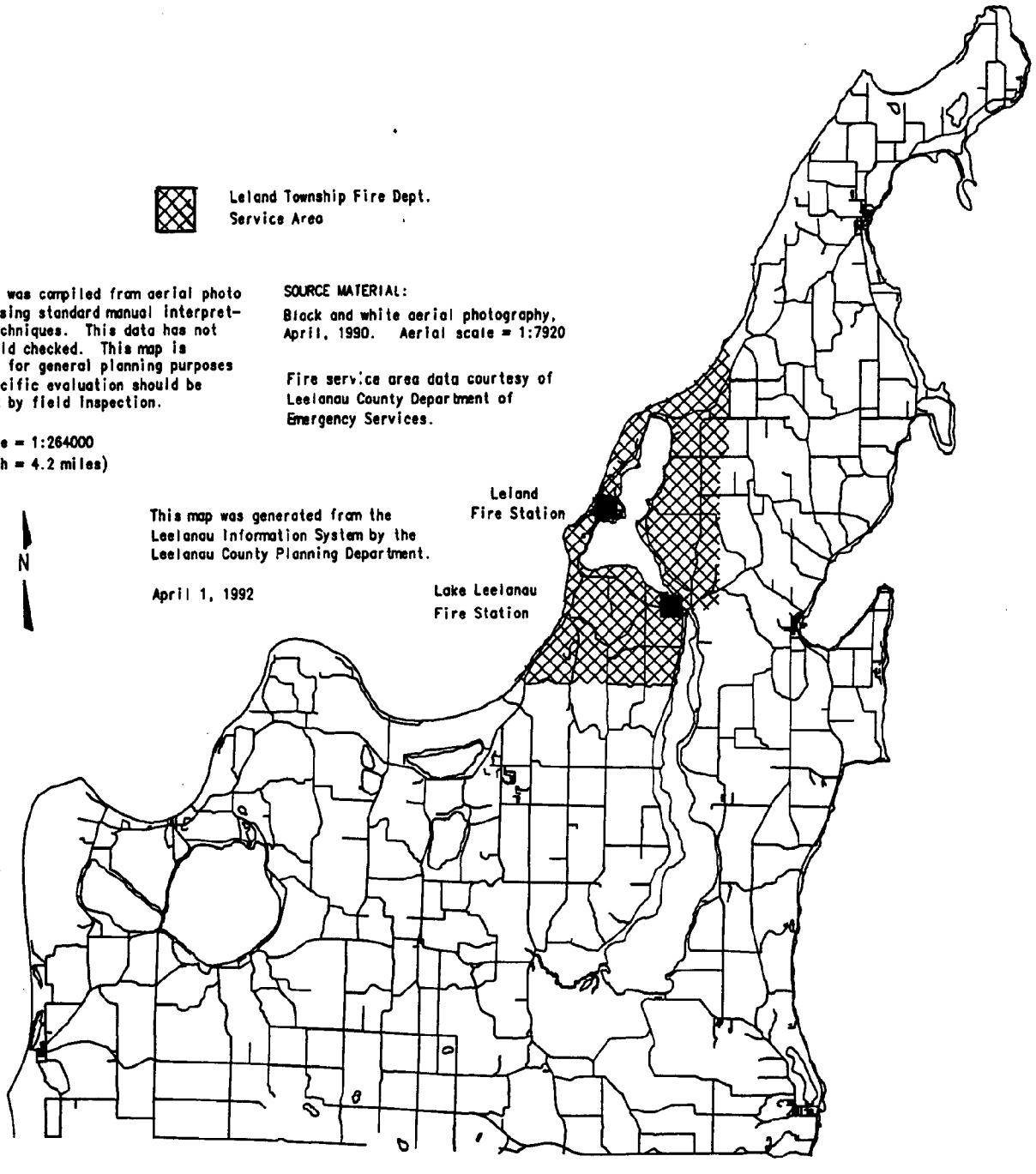

Figure 1-13f
NORTHPORT FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

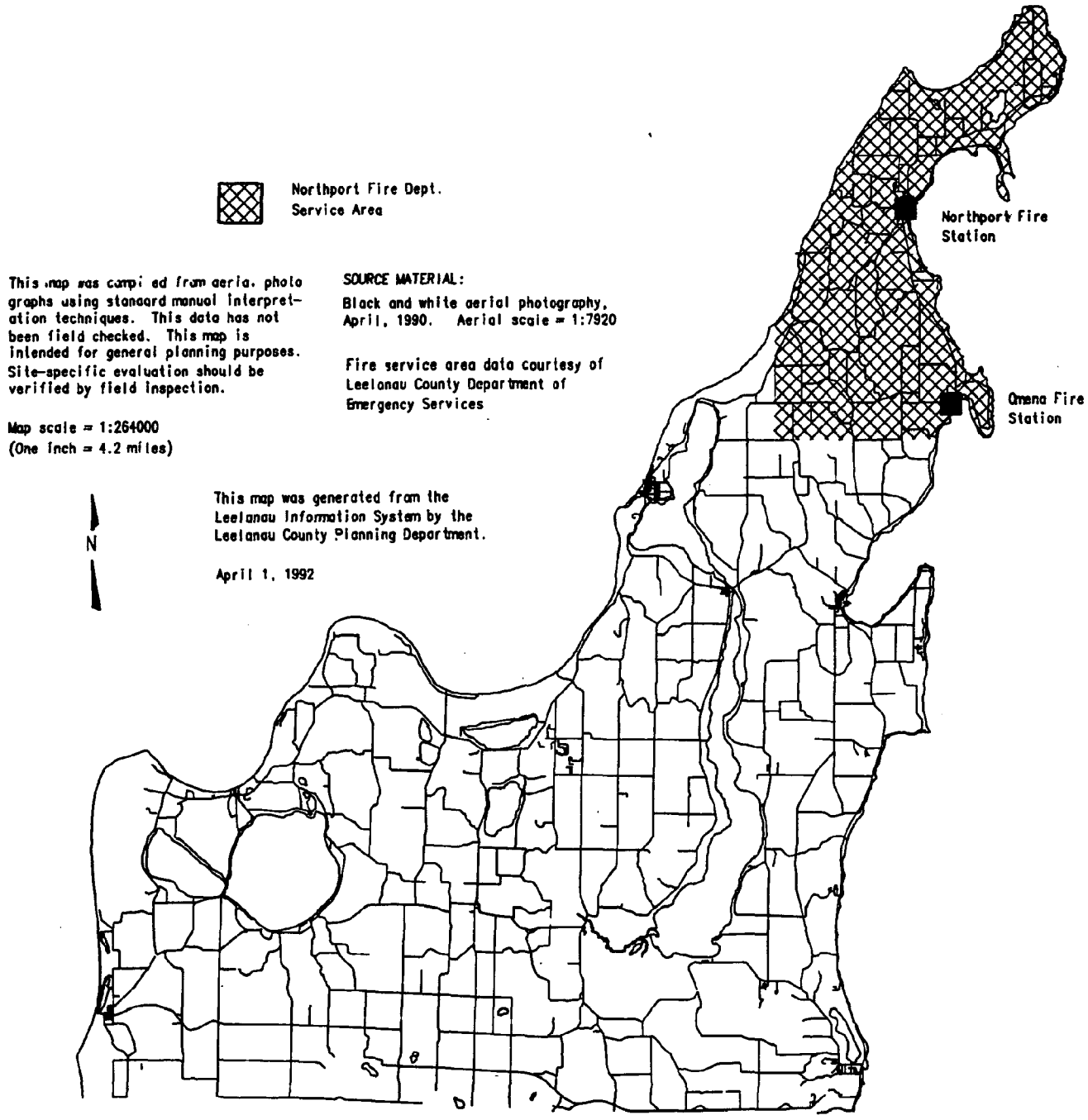

Figure 1-13g
SUTTONS BAY - BINGHAM FIRE DEPARTMENT
SERVICE AREA AND FACILITIES

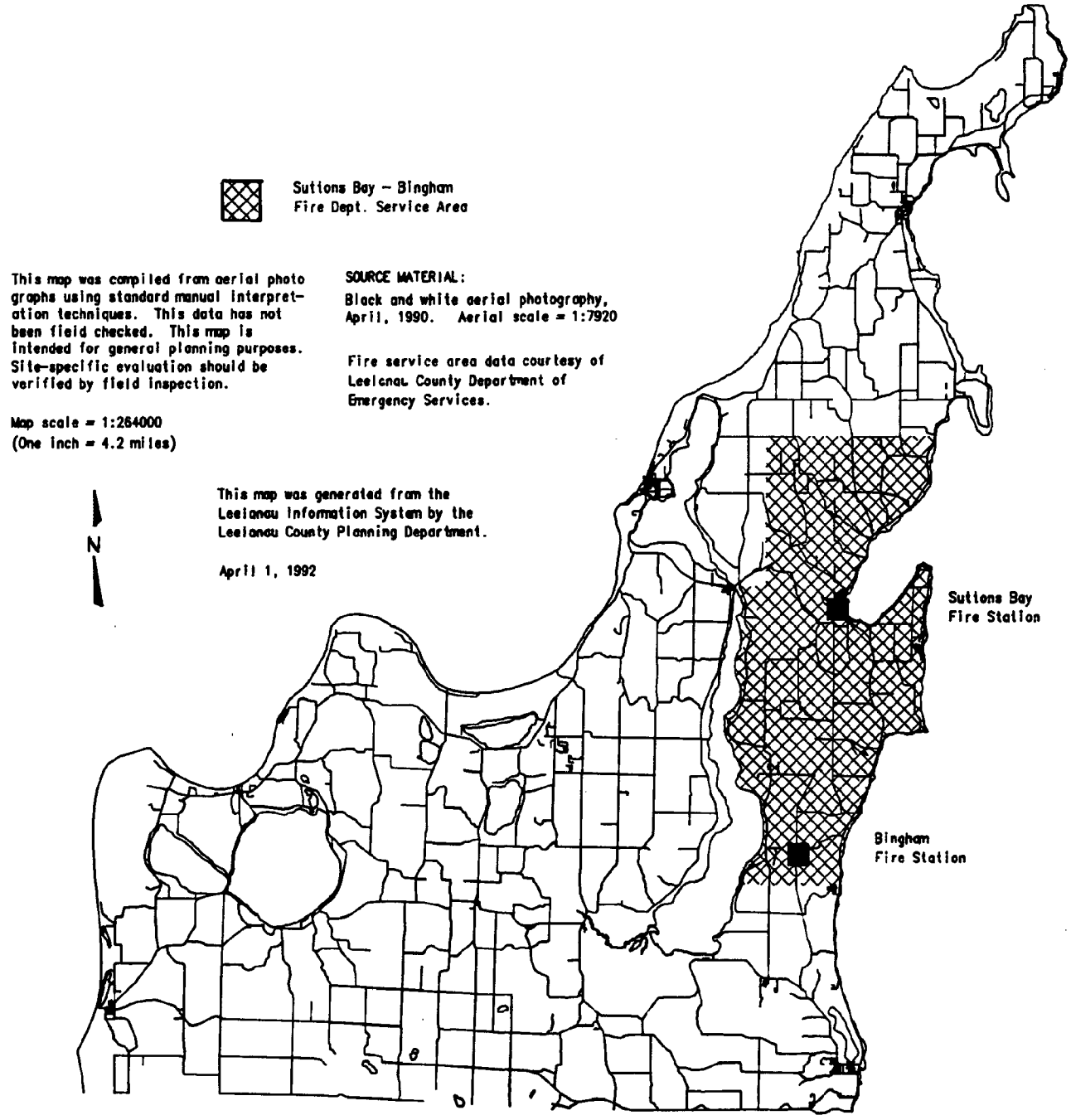

Figure 1-14
PENINSULA-WIDE MUNICIPAL FACILITIES

Chapter 2

PUBLIC FACILITIES and PHYSICAL SERVICES provided by LEELANAU COUNTY

INTRODUCTION

This chapter reviews the principal public physical facilities and physical services provided by Leelanau County. County operated facilities and services include recreation, police protection, a law library, facilities maintenance, and administration. The County road network, largely maintained by the Leelanau County Road Commission is discussed in detail in Chapter 3.

Comparatively speaking, Leelanau County does not provide extensive physical public facilities and services. The County road network can be considered the most visible facility and service operated at the County level, followed by police protection (Sheriff's Department) and general county government administration. Recreation and library services and facilities are quite limited.

All of the County's facilities and services are situated in the communities of Leland, Lake Leelanau, Suttons Bay, and Maple City. Leland, in Leland Township, is the County's principal administrative center.

PUBLIC FACILITIES and PHYSICAL SERVICES

Figure 2-1 identifies the location of all county property and facilities.

Administration

The County Courthouse in Leland is the home of most of the County's administrative activities. The County Courthouse includes the following principal administrative offices and facilities including:

- Prosecutor
- Treasurer
- Clerk
- Probate
- Small Court Room
- Large Court Room
- Law Library
- District Court
- County Board of Commissioners Room
- Register of Deeds
- Vault
- Accounting
- Youth

The Courthouse was constructed in 1964 and occupies a 1.3-acre site, includes approximately 6,500 square feet of floor space. County Planning and Equalization offices are housed in a 1200 square foot temporary structure east of the Courthouse. In addition to the County Courthouse, the County rents two "satellite" facilities in the communities of Lake Leelanau and Suttons Bay. The Provemant Building in Lake Leelanau includes approximately 2,500 square feet of floor space and is used by the County's Inspections Department and Cooperative Extension Service. The Millside Building, situated in the business. district of Suttons Bay, was constructed in 1978 and is used by the Michigan Department of Social Services for various administrative functions as well as housing the County Inspections Department and the Cooperative Extension Service. The facility includes approximately 4,900 square feet of floor space.

Two facilities are also maintained for administrative functions particular to the Leelanau County Road Commission. The Road Commission's headquarters are situated in the Village of Suttons Bay and cover approximately 1,765 square feet of floor area

within a structure initially constructed in 1952 and expanded in 1989. The vast portion of the structure, or 23,060 square feet of floor area, is utilized by the Road Commission for vehicle storage and maintenance purposes. The Road Commission operates a similar storage and maintenance facility in Maple City though considerably smaller in size, at approximately 7,455 square feet of floor area.

Police Protection

The Leelanau County Sheriff's Department provides the principal police protection services in the Peninsula. There are no local municipal police departments or private security services associated with individual large scale residential developments. However, several villages hire seasonal police officers and the State Police periodically conduct patrols in the County.

The Grand Traverse Band Police Department, composed of members from the Ottawa and Chippewa reservation, provides security services within the reservation. There exists a mutual aid agreement between the Police Department and Sheriff's Department.

In addition to the police protection services provided by the Leelanau County Sheriff's Department, the Department is also responsible for the provision of:

- jail administration
- court officers
- services of process for the courts
- marine patrol
- animal control
- fire and rescue dispatch.

All of the above services are provided to all municipalities in the Peninsula by the Sheriff's Department. The current staff comprising the Sheriff's Department includes:

- 1 Sheriff
- 1 Undersherrif
- 1 Secretary
- 2 Sergeants
- 2 Cooks
- 9 Road Deputies
- 10 Correction and Dispatch Personnel.

The Leelanau County jail was constructed in 1959 and sits across from the Court House. The jail underwent major renovations in 1982 when the resident sheriff moved out and his quarters and garage became administrative offices and an inmate library. The facility is in fair to good condition and has a capacity of 19 inmates. The facility has been experiencing increasing demand and has exceeded capacity annually since 1982. While the demand has subsided somewhat in 1992, particularly in March and April when very low demand levels were witnessed, January and February inmate levels approached or slightly exceeded capacity levels for several weeks.

Recreation

Leelanau County operates two park facilities; Old Settlers Picnic Grounds and Myles Kimmerly Recreation Area (see Figure 2-1).

The most significant of these facilities in regard to size and facilities is the Myles Kimmerly Recreation Area which covers approximately 100 acres and is situated two miles west of Maple City. Recreation opportunities at this facility include baseball, softball, picnicking, nature trails, sledding, skating, and snowmobiling, hunting, baseball, tennis, basketball, and playgrounds. The facility is considered to be in good condition.

The Old Settlers Picnic Grounds covers approximately six acres and is located two and a half miles further west from Myles Kimmerly Recreation Area on the shores of Glen Lake. Recreation opportunities at this facility include picnicking, swimming, fishing, boat launch, tennis, and playgrounds.

Law Library

The County does not operate a library in the traditional sense but does maintain a small law library, approximately 265 square feet in floor area, within the County Court House facility.

EMERGING ISSUES

Compared to similarly sized counties, Leelanau County is currently providing a fairly broad scope of services to the residents of the Peninsula. However, new service demand and as in most counties, costs are rising faster than revenues and it is increasingly difficult to provide the services currently provided. This condition can be expected to worsen as new growth and development place more demands on existing facilities.

Recreation

It has traditionally been the responsibility of a county to provide regional recreation facilities while local municipal governments have addressed smaller and usually user-based recreation needs (versus resource-based). This is particularly true in rural environments where local municipalities are typically unprepared to acquire the large acreage associated with regional facilities and appropriately staff and maintain such facilities on a long term basis. While the two County recreation facilities certainly address important recreation needs of area residents, two issues facing the County are clear. First, both of these facilities are in close proximity to one another on the east side of Glen Lake. While these facilities may be easily accessible by some, they are not necessarily easily accessible by many nor situated in the more populated areas where their use can be maximized. The location of future growth and development may further bring this issue to the surface.

Secondly, however, the most important issue facing the County in regard to recreation is the uncertainty of what sorts of county recreation facilities (if any more) Peninsula residents would like. The County does not have an area-wide recreation plan, nor has a program been developed to solicit input regarding the recreation needs of the residents. While such plans have been undertaken in some of the local municipalities, county-based recreation needs often differ and must be addressed accordingly. While the Peninsula is fortunate is have the state and federal recreation facilities available to its residents, these facilities are not programmed to specifically address the unique needs of the Peninsula residents and program flexibility is limited. As the Peninsula's population continues to grow, the County can be expected to hear increased demands for County operated recreation facilities which specifically address the needs of area residents. These needs may be met by local facilities or on an inter-jurisdictional basis, but should be examined on a Peninsula-wide basis.

Police Protection

Though a single police station and associated patrol cars may adequately meet the current needs of the Peninsula, future growth and development will place more and more strain upon police protection services. Increased crime and emergency situations will accompany this growth and development. More calls will be received from the more outlying areas of the Peninsula and response time will become a greater concern among residents. Visibility of police protection services throughout the Peninsula will become increasingly important as a crime deterrent mechanism.

General Government Facilities

At present, Leelanau County is struggling to house its numerous offices and departments. County administration offices are not centrally located and as a result, many feel the County government is not operating as efficiently as it could be and tax dollars are not being maximized. Similarly, county-wide planning and administration efforts are hampered by the lack of easy accessibility between departments and personnel due to the lack of centralized facilities. The County is also running out of available space to house its operations, as witnessed by the fact that temporary modular structures have been established at the Courthouse facility as long as 12 years ago. These "temporary" facilities do not lend themselves to maximizing the

efficiency of government operations nor facilitate necessary and effective day-to-day communications between departments and personnel. They are also less architecturally appealing than a single facility and do not enhance the visual quality of the area.

As the population of the Peninsula continues to grow and development throughout the Peninsula increases, the County will come under increasing pressure to maintain current levels of operation and to possibly expand its current scope of administrative activities. Leelanau County officials are very cognizant of this. A peninsula-wide review of all County facilities has just been initiated to identify preferred options for future space and the location of new facilities.

County Drains

Presently, while there has recently been created the Office of Drain Commissioner there are no County drains. An inventory of the quality of the natural drainage system to handle stormwater runoff is currently underway. Until completed, it is not possible to indicate the extent to which, if any, public drainage improvements may be necessary.

ITEMS FOR DISCUSSION

The limited extent of existing County public facilities when compared to the sustained effect of current rates of growth and the existing fragmentation of County facility locations suggest the following:

1) Future land use and growth and the administration of county activities and services should be strongly linked to better assure efficiency of operations, proximity to critical service areas, improved accessibility, visibility and communication with the general public.
2) Consideration should be given to the most appropriate location for the County seat based upon the geographic locations of future planned land uses and the delivery of County services. Figure 2-2 illustrates the relationship between current municipal populations and their respective distances to the current County seat in Leland. Figure 2-3 illustrates the relationship between past growth rates of municipalities and their distances to the County seat.
3) The County should establish a long range plan for County administrative facilities and develop an implementation program. The long range plan should recognize that future County services may extend beyond the current scope of services provided.
4) A County-wide recreation program should be developed in conjunction with local units of government to identify current Peninsula-wide recreation needs, identify what the County's role should be in addressing these needs, and establish specific strategies to fulfill its role and provide the necessary facilities.
5) Future police protection should be linked to satellite stations in principal population areas to better assure quick response times, visibility in, and communication with, local municipalities and affected citizens.
6) Future locations of police protection facilities should be linked to principal transportation corridors and strategically positioned to avoid impassable barriers, including Lake Leelanau.

Figure 2-1
County Facilities

Figure 2-2
Municipal Populations and Distances to the County Seat

Figure 2-3
Growth Rates of Municipalities and Distances to County Seat

Chapter 3

TRANSPORTATION

INTRODUCTION

We live in a society of movement. People often live in one community, work in another community, send children to school in a third community, and do shopping in still a fourth community. The travel patterns of the Leelanau Peninsula reflect this phenomenon as well and highlight the need for an adequate transportation network, both in regard to the efficient movement of traffic, safety, and provision of emergency services. As the intensity of land development increases, so does a community's need for a roadway network able to accommodate the increased traffic demand. Commercial land uses attract retail and service trade and new residential developments house more individuals and families with daily needs, all of which results in increased demand for better road services.

This chapter reviews transportation facilities and services in the Peninsula. The majority of the chapter focuses specifically upon the County operated road network. The chapter also discusses public transit transportation facilities as well as non-vehicular transportation facilities in the Peninsula including bike paths and pedestrian circulation systems.

The chapter begins with a review of the principal characteristics of the roadway network within the Peninsula. The review examines the existing network according to a number of parameters including roadway type, location, right-of-way, classification, capacities, service levels, condition, driving times, accidents, relationship to area land use patterns, and traffic counts. Also presented are currently needed improvements and currently programmed improvements. Finally, projected roadway conditions are reviewed including traffic volumes, driving times, and necessary new facilities.

STATE ROAD NETWORK

The foundation of the Peninsula's roadway network is state highway M-22 which generally travels along the Peninsula's eastern and western shorelines as far north as the Village of Northport. M-72 intersects with the eastern and western arms of M-22 in the southern periphery of the Peninsula to complete this critical loop. M-204 traverses the Peninsula across Lake Leelanau providing a critical linkage of east to west. Linking and feeding this 109 mile system of state highways is a 634 mile system of county roads. This is supplemented by 19 miles of Village roads in Empire, Suttons Bay and Northport and an unknown number of miles of private roads (see Figure 3-1).

COUNTY ROADWAY NETWORK

Existing Network

Pattern and Classification

The roadway network within the interior of Leelanau Peninsula does not reflect the grid-like pattern typically associated with county and township networks. This is due in large part to the large lakes in the Peninsula and the many steep hills and valleys. The vast majority of roadway miles in the Peninsula are paved. The greatest concentration of those roads that are not paved is in the Sleeping Bear Dunes National Lakeshore and nearby private lands (see Figure 3-2). The majority of non-paved roadway segments outside of this vicinity are fairly short in length and/or terminate as a dead-end.

All weather roads in the Peninsula are primarily limited to sections of M-22, M-72, and M-204 (see Figure 3-3). Except for the limited number of gravel or dirt roads in the Peninsula which are considered seasonal, all

other roads are considered year-round roads (see Figure 3-4).

Figure 3-5 identifies the classification of the Peninsula's roadway network according to the National Functional Classification Systems employed by the Michigan Department of Transportation. Figure 3-6 identifies the Peninsula's roadway network according to a classification system established by the Leelanau County Planning Department for local planning purposes. The two classification schemes for the Peninsula are substantively very similar. Both document the importance of the M-22/M-72 loop around the Peninsula although Figure 3-6 also identifies M-204, from Suttons Bay to M-22 just south of Leland, as a corridor of equal importance. The principal difference between these Figures is MDOT's use of the "rural major collector" designation for road segments which the County Planning Department has chosen to classify in more detail through the designations of "local arterial" and "collector". Aside from the M-22/M-72 loop, MDOT has classified the vast majority of road miles as "rural major collectors". Both classification systems identify the lack of principal corridors providing direct travel throughout the Peninsula and a considerably disproportionate relationship between principal north-south corridors and the relatively limited opportunities for direct east-west travel within the Peninsula.

Roadway Conditions and Service Levels

The adequacy of the levels of service provided by the Leelanau Peninsula roadway network are the result of several factors including road construction characteristics and associated deterioration characteristics, design capacities, and traffic counts.

Road base conditions are of paramount importance to the maintenance of roadway surface conditions. An inadequate road base can lead to regular and persistent road surface deterioration and increase both traffic hazards and maintenance costs. As Figure 3-7 illustrates, few road segments within the Peninsula are considered to have an excellent base. Similarly, only a small portion of the road mileage in the Peninsula is characterized by poor or very poor base conditions. The vast majority of the roadway network is considered to have fair or good base conditions.

Of particular importance within the Peninsula however, is the road base conditions of the more critical road segments. While the Peninsula may be characterized by limited road segments with poor or very poor base conditions, many of those segments that have been designated as such are particularly important components of the network. The entire M-72 corridor, and nearly the entire M-22 corridor from Leland south to Empire, is characterized by poor or very poor base conditions. Further, no segment of M-22 throughout the entire Peninsula has base conditions that could be considered better than fair, except the first 7 miles north of Traverse City.

As illustrated in Figure 3-8, the majority of roads considered to have poor or very poor surface conditions are concentrated along the Peninsula's southern periphery and in the far northern limits of the Peninsula. The surface conditions of some of the more critical segments of the network exceed those of their bases including sections of M-22 and M-72.

The vast majority of road surfaces considered to be in excellent condition were resurfaced in the past 12 years, as illustrated in Figure 3-9. Though a considerable number of road segments have been resurfaced since 1980, the Peninsula is predominantly characterized by roads which were last resurfaced between 1960 and 1969. While the useful life of a road surface varies depending on many factors (road base, traffic, weather, surface material, etc.) an asphalt surface (plant mix) on a good base has a life of 15 or more years with proper maintenance and low traffic.

As Figure 3-10 illustrates, the vast majority of road segments in the Peninsula under the jurisdiction of the County experience average daily traffic counts of less than 1,000.

Those road segments experiencing higher counts are generally limited to the M-22, M-72, and M-204 corridors and several other segments in the Peninsula's southern half. The highest counts in the Peninsula are evident along sections of M-22 and M-72 just north and west of Traverse City and along county route 629 near Northport Point. Traffic along M-22 in this area exceeds 20,000 vehicles per day. The first traffic light was installed in the County in 1991 to help regulate flow along this busy stretch.

As Figure 3-11 illustrates, nearly the entire County roadway network is comprised of right of way between 50 to 74 feet in width. The principal exceptions are M-22 from Traverse City to Suttons Bay and M-204 from Suttons Bay to Lake Leelanau, which fall within the right of way width range of 100 to 150 feet.

Figure 3-12 and Table 3-1 identify the average traveling times during the off-peak season and distances along road segments in the Peninsula.

Projected traffic counts are identified in Figure 3-13 and Table 3-2. Those segments expected to experience the greatest increase in traffic flow are _____.

Figure 3-14 and Table 3-3 provide accident data. Those areas of the Peninsula which have experienced the greatest number of accidents are _____. Specific road segments and intersections characterized by high accident counts include _____.

Level of service data refers to the relative degree that a road segment is fulfilling its function of moving traffic in an efficient manner and according to its design characteristics. Figure 3-15 and Table 3-4 identify the levels of service associated with the Peninsula's road segments. Particularly low levels of service are evident along _____.

TRANSIT SERVICES
Figure 3-16

AIRPLANE FACILITIES
Figure 3-17 (include T.C.)

RAILROAD FACILITIES
Figure 3-18

BICYCLE FACILITIES
Figure 3-19

PEDESTRIAN FACILITIES
Figure 3-20 a, b, c, d,

ROAD ENDS
Figure 3-21

EMERGING ISSUES

Current and Projected Conditions

A number of issues face the Peninsula which currently hinder, and can be expected to further hinder, the efficient and safe movement of traffic throughout the Peninsula. Most critical of these challenges is the level of service provided by the County operated roadway network.

- While the levels of service along the vast majority of roadway segment could be described as fair or better, those segments which are the backbone of the Peninsula's network are in places, providing the lowest levels of service. This is particularly true on M-22, along the eastern shoreline of the Peninsula, and M-72. Future growth and development will further negatively impact existing levels of service and may place road segments in a critical public hazard condition. On the other hand, improvements will likely stimulate new demand and more development.
- Traffic counts are increasing at an overall higher rate among less used road segments than existing high demand segments. While this may be a result of locational development patterns or in response to the congestion associated with the high demand

segments, the impact is the same; increased demands are being placed upon road segments not necessarily designed or intended to accommodate significant increases in use.

- Key components of the roadway network, including M-22 and M-72, are constructed upon poor base conditions and will continue to require constant maintenance, traffic flow interruptions, and the diversion of dollars from other needed projects, unless reconstruction programs are implemented. Future increased use of these corridors will invariably result in higher frequencies of maintenance needs.
- Very few road segments carrying 1,500 or more vehicles per day meet the generally accepted road surface width standard of 24 feet. Road surface widths are often as low as 20 feet, including vast sections of M-22, M-72, M-204 and other principal corridors. The limited widths significantly limit operational conditions of the corridors and their respective safety levels. As additional vehicles are placed upon the road network in light of future growth and development, operational conditions become that much more critical.
- Many of the principal corridors throughout the Peninsula are characterized by right of way widths of 66 feet, thereby increasing the acquisition costs for future widening, realignment, and the addition of lanes. The need for additional right of way will increase as growth and development places increased demands on the road network.
- The increasing rate of lot splits along arterial and collector roads, and associated curb cuts, are interfering with the function and safety of these corridors. As growth and development continue, this condition could be further exacerbated resulting in extended driving times and increased accident rates.
- The Peninsula's topography and inland water bodies place unique constraints upon the efficient movement of traffic throughout the Peninsula.

ITEMS FOR DISCUSSION

The poor condition of significant stretches of state and county roads in the Peninsula suggest the following:

1) The location of future growth and development should be directly linked to roadway corridors designed to accommodate the anticipated increase in demand, or linked to capital improvements intended to upgrade those road segments not currently capable of adequately accommodating the increased demands.
2) Right of way preservation measures should be implemented to better enable future roadway expansions at a lower public cost.
3) Future land use and development patterns should critically link road function characteristics to safe access.
4) Improvements to the roadway network, in the form of new road segments, should be considered to provide more efficient movement throughout the Peninsula.
5) Access along principal thoroughfares should be more effectively regulated to minimize opportunities for congestion and safety hazards.
6) All future new County or State operated roads should be designed and constructed to accommodate safe and functional bicycle transportation.
7) Improvements to the roadway network, in the form of reconstructed and/or realigned intersections, should be considered to provide more efficient movement throughout the Peninsula.
8) Improvements to the existing roadway network through general maintenance

and reconstruction, should be considered to provide more efficient movement throughout the Peninsula. Future expenditures and capital improvement planning should recognize the long term need to improve the roadway base conditions of M-22 and M-72.

9) Improvements to the roadway network, in the form of new road segments, should be considered to accommodate a portion of the demand currently placed upon M-22.

10) Some new roads will be necessary to provide more direct alternative routes in certain areas such as completion of a proposed segment between Bugai Road and Mann Road in Elmwood Township.

Table 3-1
LEELANAU COUNTY TRAVEL TIME AND MILEAGE WORKSHEET

Road	From	To	Total Miles (Nearest Tenth)	March 1992 Total Time (Nearest Minute)	July 1992 Total Time (Nearest Minute)
(sample) CR-696	M-10	CR-654	5.6	12:15	
M-22	M-72	Cherry Bend Rd.	1.3	2:00	
M-22	Cherry Bend Rd.	Bingham Rd.	6.3	7:00	
M-22	Bingham Rd.	Broadway (SB)	7.2	8:00	
M-22	Broadway (SB)	M-204 (SB)	0.5	1:00	
M-22	M-204 (SB)	CR-633	1.7	3:00	
M-22	CR-633	Peshawbestown	1.7	2:00	
M-22	Peshawbestown	CR-626	2.9	4:00	
M-22	CR-626	CR-631	3.0	4:00	
M-22	CR-631	M-201	2.2	2:00	
M-22	M-201	CR-633	1.9	4:00	
M-22	CR-633	CR-637	2.8	4:00	
M-22	CR-637	CR-626	2.0	3:00	
M-22	CR-626	CR-641	1.2	2:00	
M-22	CR-641	River St.	3.2	4:00	
M-22	River St.	M-204	2.1	3:00	
M-22	M-204	CR-651	4.0	5:00	
M-22	CR-651	CR-667	3.5	4:00	
M-22	CR-667	CR-669	1.1	1:30	
M-22	CR-669	CR-675	6.8	8:00	
M-22	CR-675	M-109	2.8	4:00	
M-22	M-109	CR-61 6/677	2.9	5:00	
M-22	CR-616/677	CR-61	0.7	2:00	
M-22	CR-616	M-109	2.1	4:00	
M-22	M-109	M-72	2.1	3:00	
M-22	M-72	Manning Rd.	2.7	4:00	
M-72	M-22	CR-616	2.7	4:00	
M-72	CR-616	CR-651	4.1	5:00	
M-72	CR-651	CR-667	4.2	6:00	
M-72	CR-667	CR-669	2.1	3:00	
M-72	CR-669(S)	CR-669(N)	1.1	2:00	
M-72	CR-669	CR-675	3.1	3:00	
M-72	CR-675	CR-677	2.1	2:00	
M-72	CR-677	M-22	3.4	5:00	
M-109	M-22	M-209	2.0	2:00	
M-109	M-209	CR-616	2.8	3:00	
M-109	CR-616	M-22	2.0	3:00	
M-201	M-22	DeLong Rd.	2.1	4:00	
M-204	M-22	CR-645	2.1	2:00	
M-204	CR-645	CR-643	1.0	2:00	
M-204	CR-643	CR-641	0.3	1:00	
M-204	CR-641	CR-637	2.0	2:00	
M-204	CR-637	M-22	1.9	2:00	

Table 3-1 (continued)
LEELANAU COUNTY TRAVEL TIME AND MILEAGE WORKSHEET

Road	From	To	Total Miles (Nearest Tenth)	March 1992 Total Time (Nearest Minute)	July 1992 Total Time (Nearest Minute)
M-209	M-109	Sleeping Bear Dr.	0.4	1:00	
CR-614	CR-633	CR-641	1.0	2:00	
CR-614	CR-641	CR-616	5.2	7:00	
CR-616	M-72	CR-614	5.2	8:00	
CR-616	CR-614	CR-651	1.4	4:00	
CR-616	CR-651	CR-667	3.1	4:00	
CR-616	CR-667	CR-669(E)	1.7	2:00	
CR-616	CR-669(E)	CR-669(W)	0.3	0:30	
CR-616	CR-669(W)	CR-675(E)	2.5	3:00	
CR-616/675	CR-675(E)	CR-675(W)	2.4	5:00	
CR-616	CR-675(W)	M-22/CR-677	1.8	2:00	
CR-616	M-22	M-109	1.4	3:00	
CR-618	M-22	CR-633	1.6	3:00	
CR-618	CR-633	CR-641	0.9	1:00	
CR-620	CR-643	CR-64	1.2	2:00	
CR-620	CR-645	CR-651	2.0	2:00	
CR-622	CR-633	E. Pine View Rd.	0.4	0:30	
CR-626	M-22	CR-637	1.2	2:00	
CR-626	CR-637	CR-633	1.4	2:00	
CR-626	CR-633	CR-631	1.9	3:00	
CR-626	CR-631	M-22	1.1	2:00	
CR-629	CR-640	CR-640	1.8	3:00	
CR-629	CR-640	Lighthouse Point	3.8	5:00	
CR-631	CR-626	M-22	2.5	3:00	
CR-633	M-22	CR-614	3.1	4:00	
CR-633	CR-614	CR-618	3.8	5:00	
CR-633	CR-618	CR-622	6.6	8:00	
CR-633	CR-622	M-22(SB)	0.7	3:00	
CR-633	M-22	CR-626(S)	3.6	5:00	
CR-633/626	CR-626(S)	CR-626(N)	0.2	0:30	
CR-633	CR-626(N)	M-22	3.9	5:00	
CR-637	M-204	CR-626(S)	4.3	5:00	
CR-637/626	CR-626(S)	CR-626(N)	0.7	1:00	
CR-637	CR-626(N)	M-22	1.6	2:00	
CR-640	DeLong Rd.	CR-629	0.9	1:00	
CR-640	CR-629	CR-629	2.2	4:00	
CR-641	M-22	M-204	5.8	9:00	
CR-641	M-204	CR-618	8.4	10:00	
CR-641	CR-618	CR-614	3.6	5:00	
CR-643	CR-645	CR-620	7.0	8:00	
CR-643	CR-620	M-204	4.2	5:00	
CR-645	CR-651	CR-643	0.5	1:00	
CR-645	CR-643	Gatske Rd.	1.7	2:00	
CR-645	Gatske Rd.	CR-620	3.7	5:00	
CR-645	CR-620	M-204	4.6	6:00	

Table 3-1 (continued)
LEELANAU COUNTY TRAVEL TIME AND MILEAGE WORKSHEET

Road	From	To	Total Miles (Nearest Tenth)	March 1992 Total Time (Nearest Minute)	July 1992 Total Time (Nearest Minute)
CR-651	M-72	CR-616(S)	2.6	3:00	
CR-651/616	CR-616(S)	CR-616(N)	2.7	4:00	
CR-651	CR-616(N)	CR-645	0.4	1:00	
CR-640	CR-629	CR-629	2.2	4:00	
CR-641	M-22	M-204	5.8	9:00	
CR-641	M-204	CR-618	8.4	10:00	
CR-641	CR-618	CR-614	3.6	5:00	
CR-643	CR-645	CR-620	7.0	8:00	
CR-643	CR-620	M-204	4.2	5:00	
CR-645	CR-651	CR-643	0.5	1:00	
CR-645	CR-643	Gatske Rd.	1.7	2:00	
CR-645	Gatske Rd.	CR-620	3.7	5:00	
CR-645	CR-620	M-204	4.6	6:00	
CR-651	M-72	CR-616(S)	2.6	3:00	
CR-651/616	CR-616(S)	CR-616(N)	2.7	4:00	
CR-651	CR-616(N)	CR-645	0.4	1:00	

Table 3-2
PROJECTED TRAFFIC COUNTS

Table 3-3
MAJOR TRAFFIC ACCIDENT LOCATIONS

Table 3-4
ROADS WITH THE LOWEST EXISTING LEVEL OF SERVICE

Figure 3-1
LEGAL ROAD NETWORK

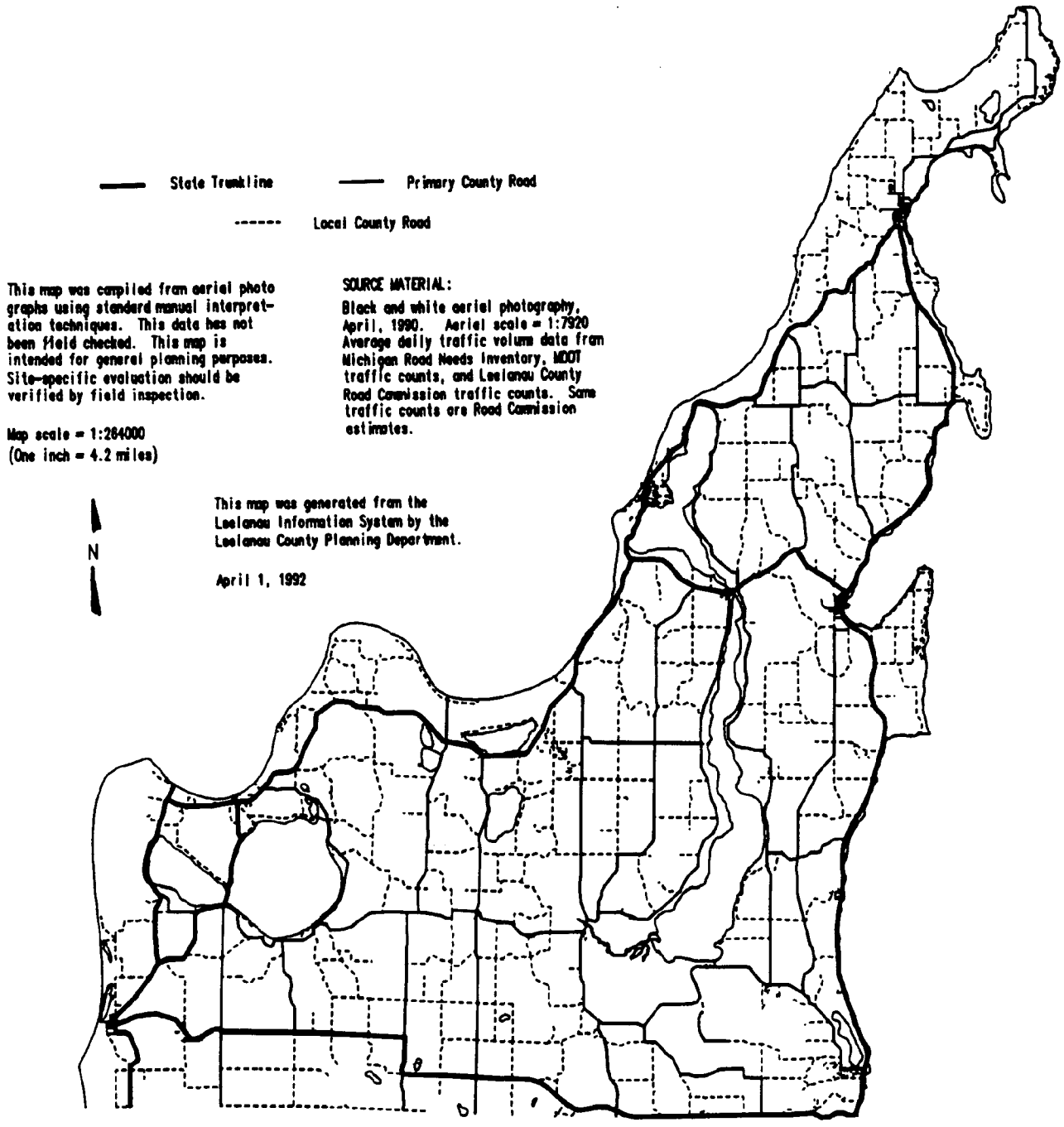

Figure 3-2
ROAD SURFACE TYPE

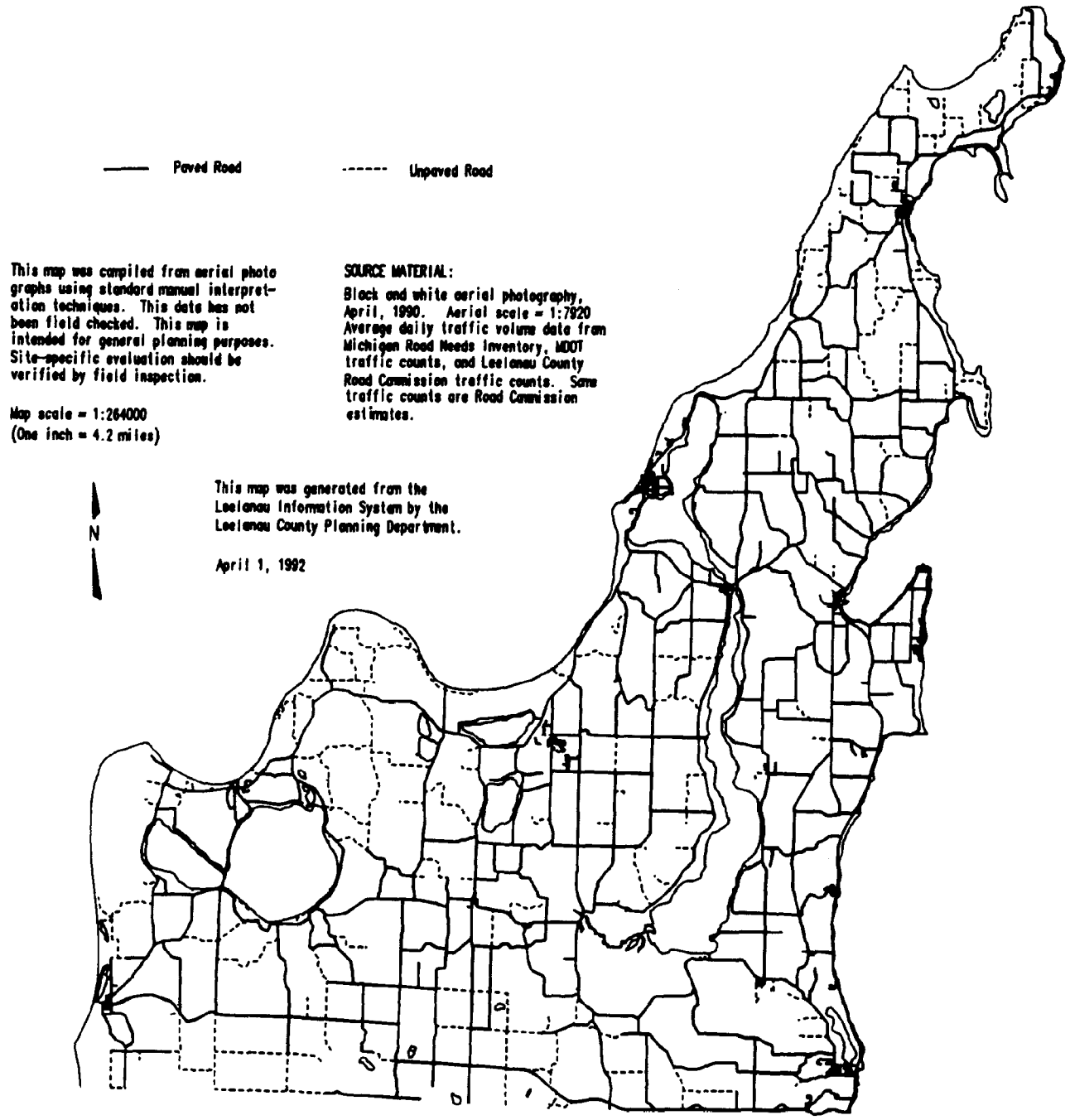

Figure 3-3
ALL WEATHER ROADS

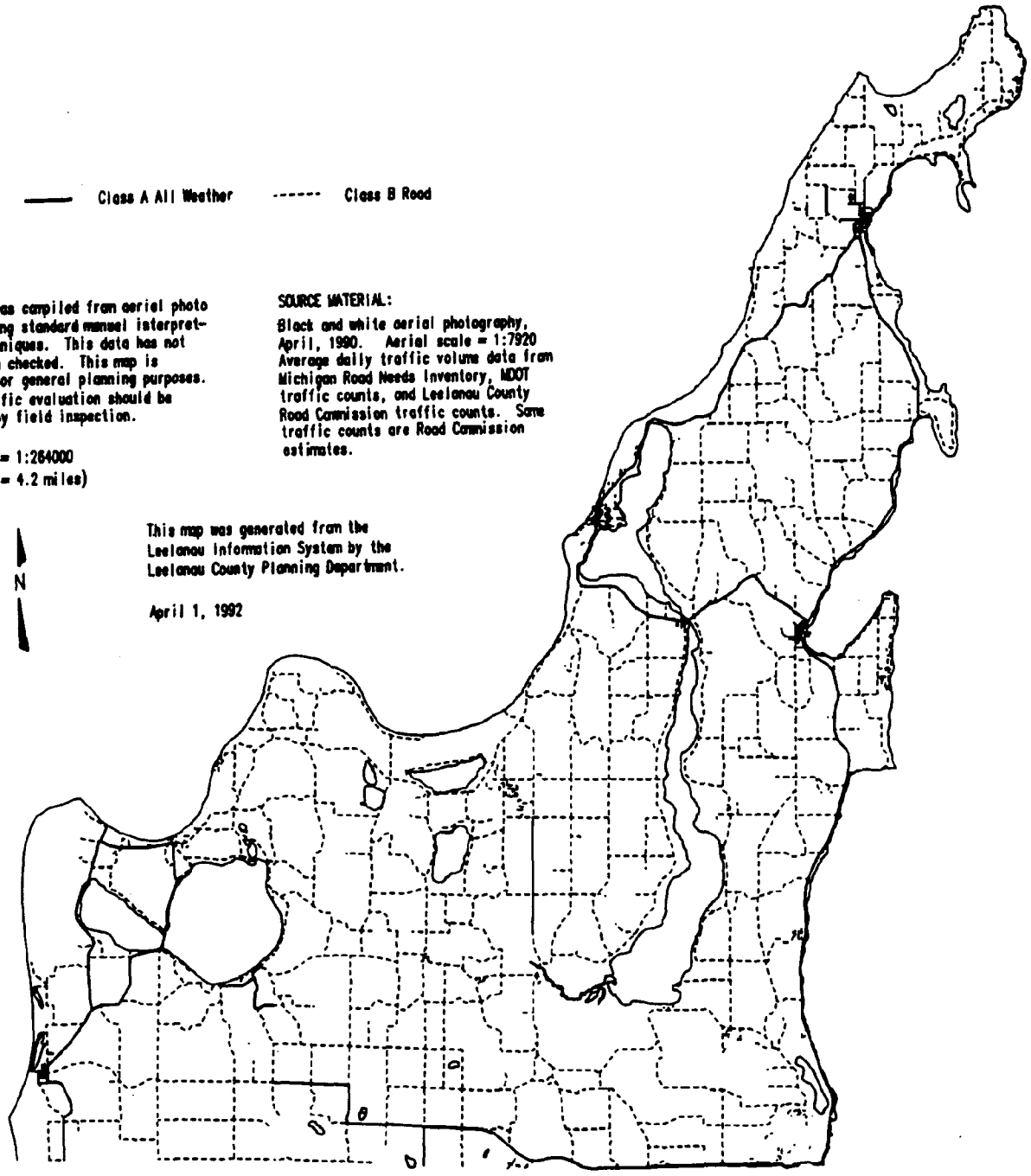

Figure 3-4
SEASONAL ROADS

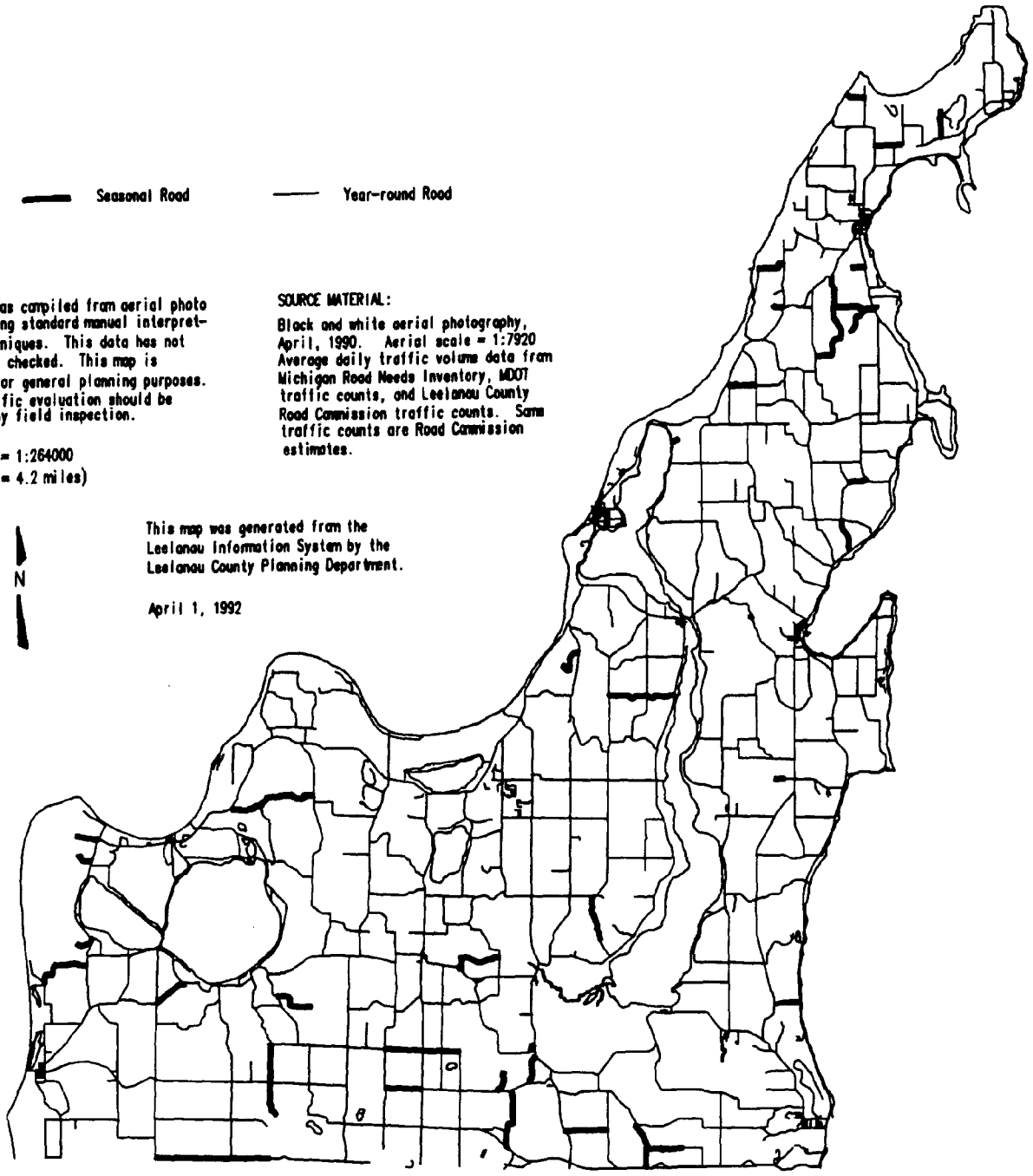

Figure 3-5
ROAD FUNCTIONAL CLASSIFICATION (NFCS)

Figure 3-6
ROAD FUNCTIONAL CLASSIFICATION (COUNTY)

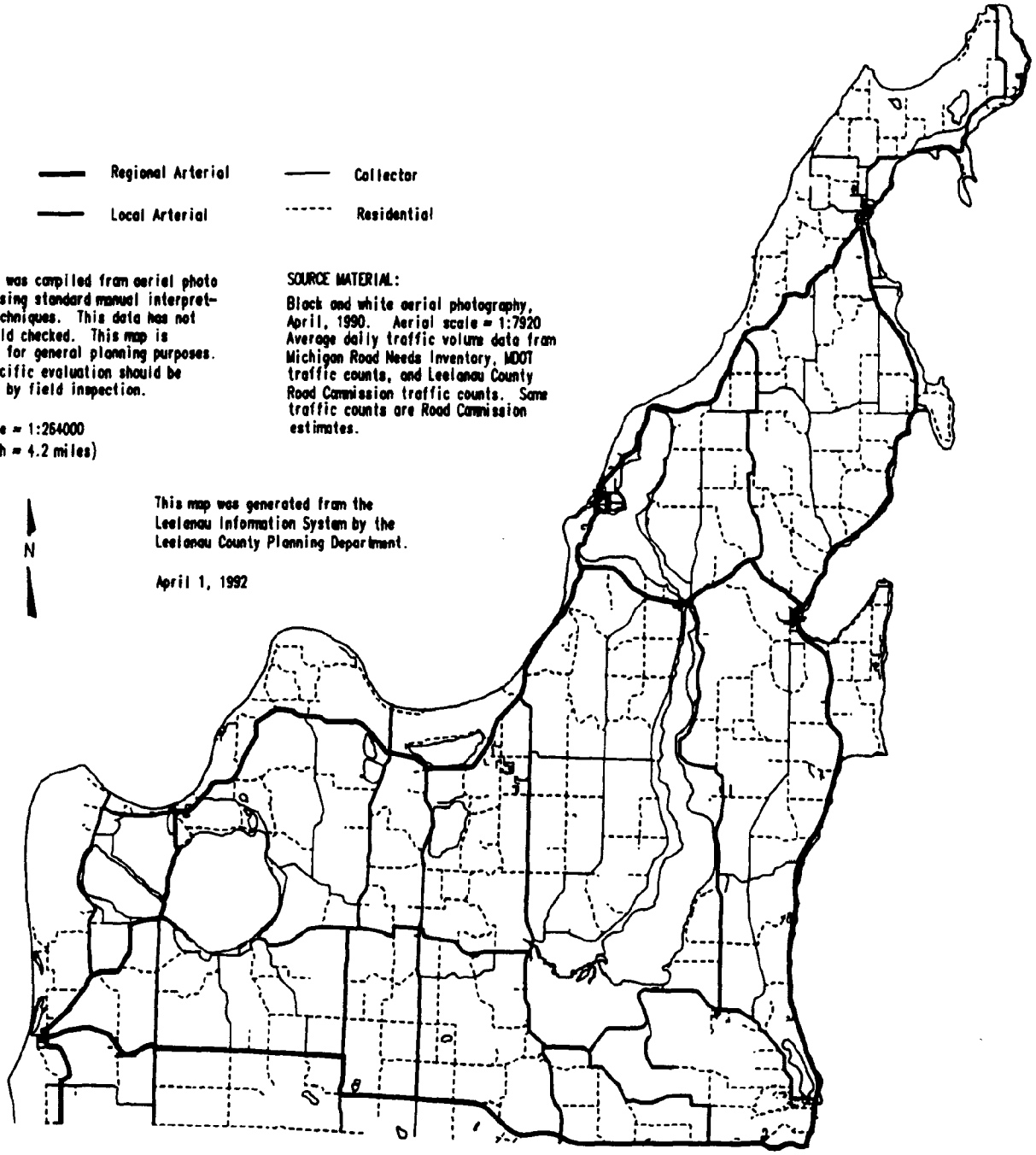

Figure 3-7
ROAD BASE FACTOR

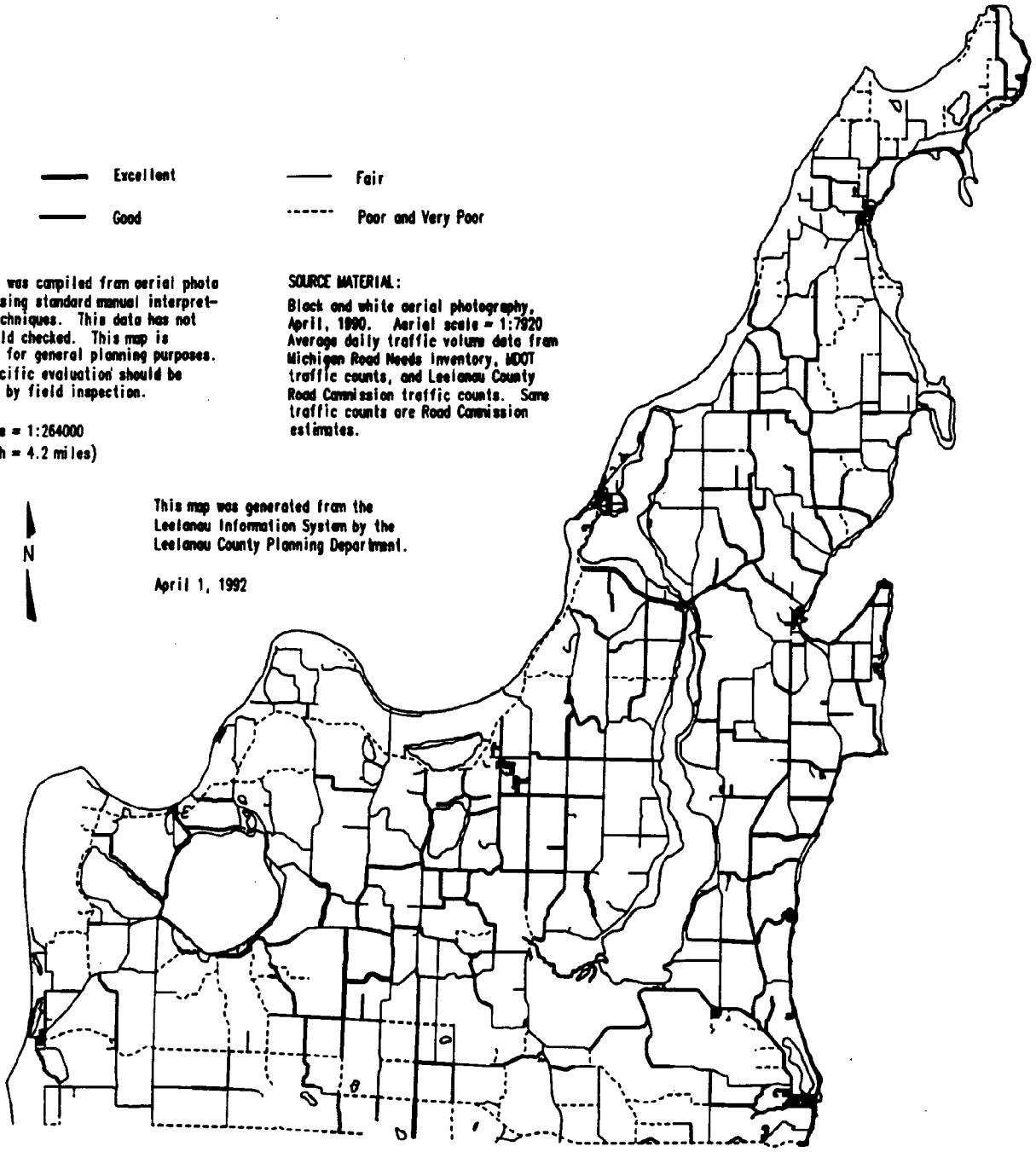

Figure 3-8
ROAD SURFACE DETERIORATION FACTOR

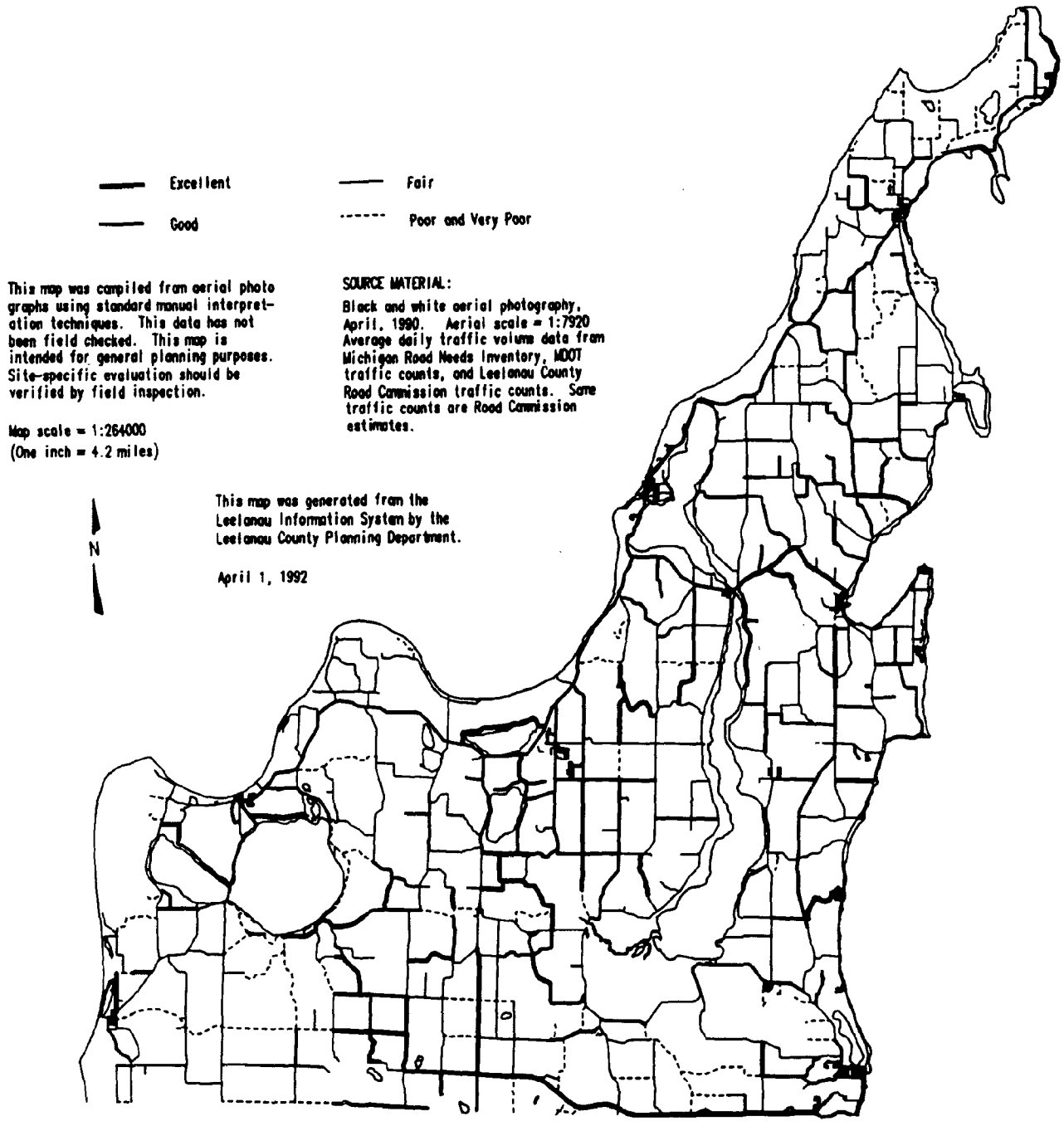

Figure 3-9
YEAR OF LAST ROAD RESURFACING

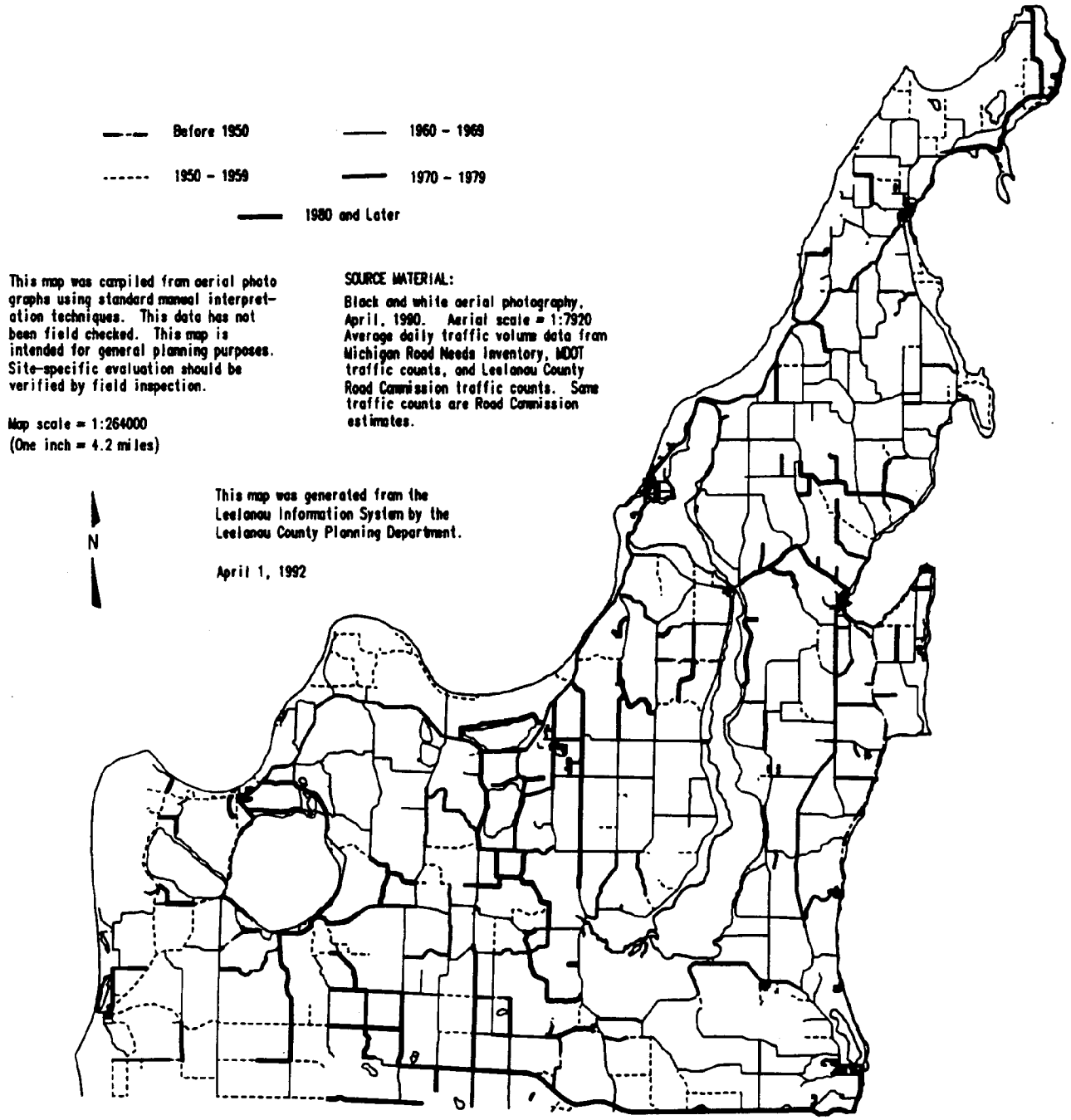

Figure 3-10
EXISTING AVERAGE DAILY TRAFFIC VOLUMES

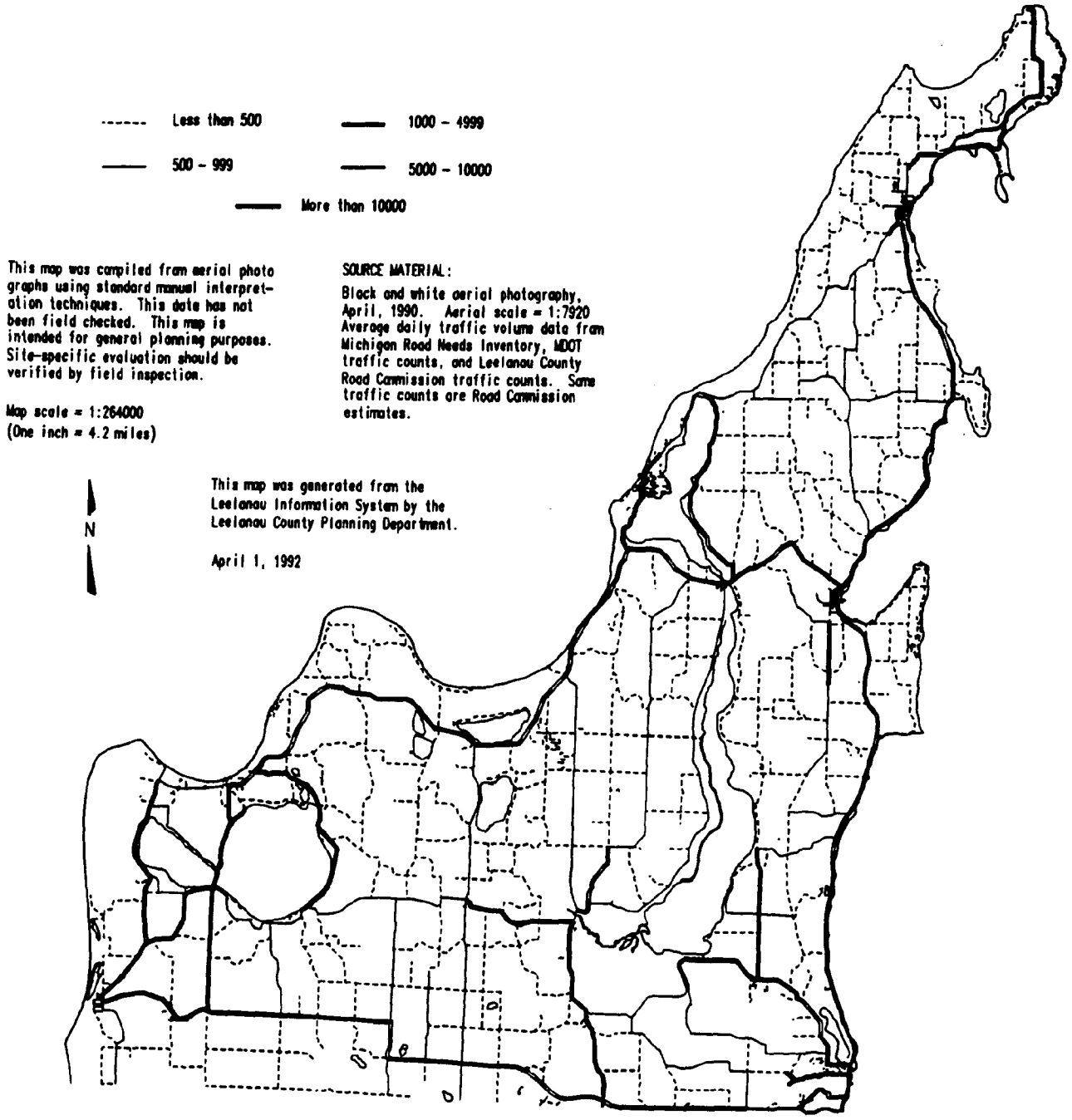

Figure 3-11
EXISTING ROAD RIGHT-OF-WAY WIDTH

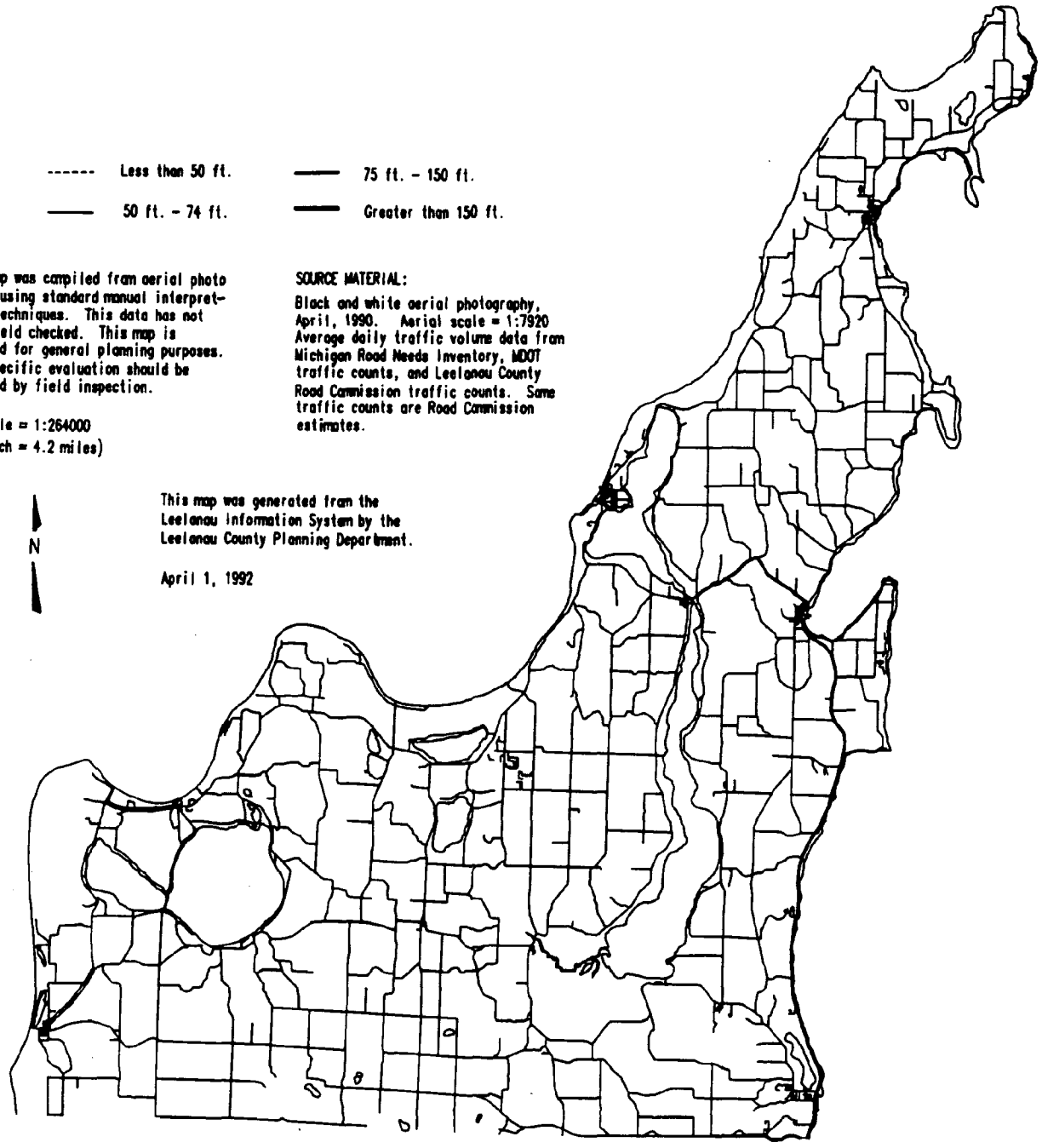

Figure 3-12
AVERAGE TRAVEL TIMES AND DISTANCES

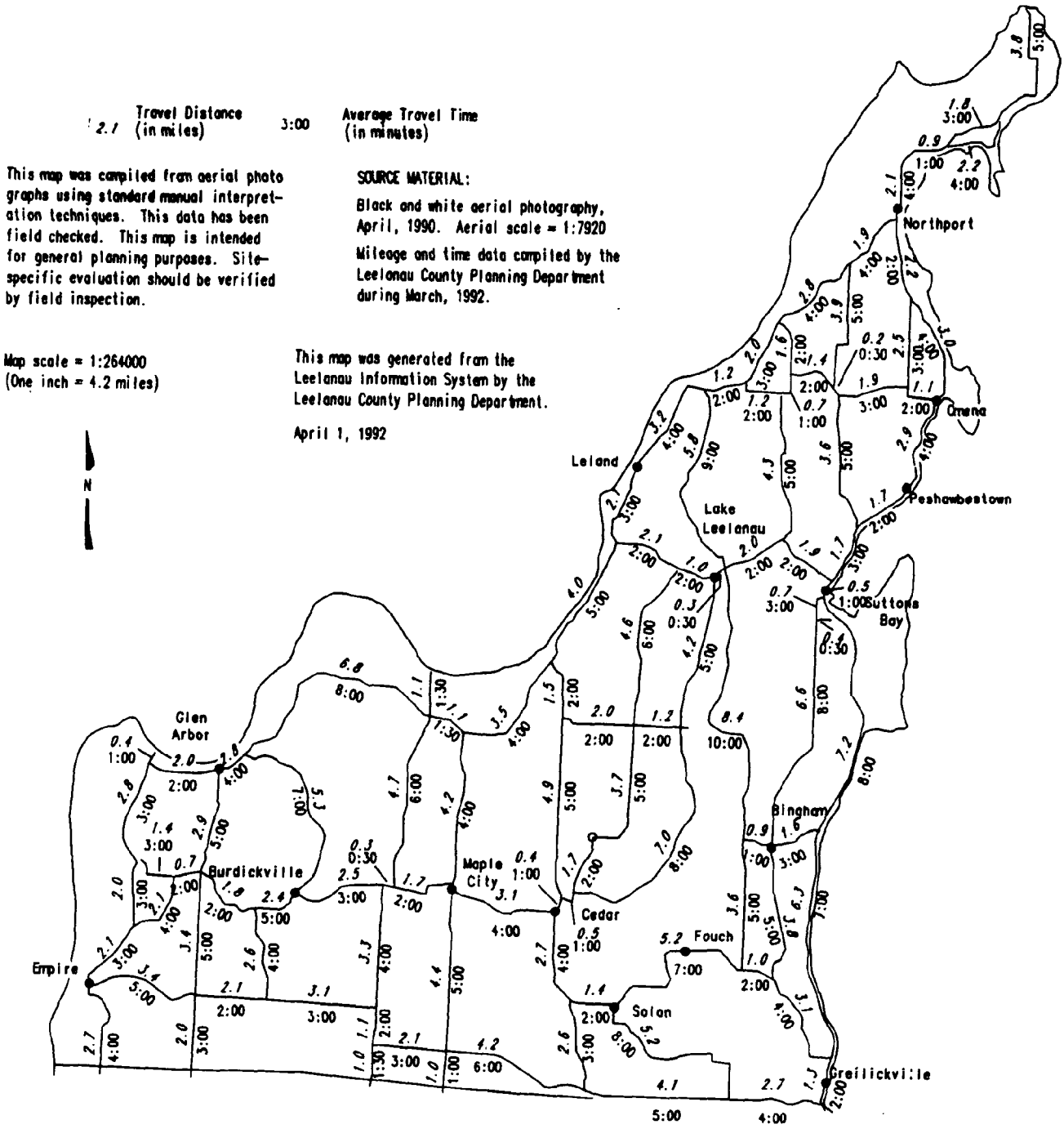

Figure 3-13
PROJECTED TRAFFIC VOLUMES

Figure 3-14
TRAFFIC ACCIDENT LOCATIONS

Figure 3-15
LEVEL OF SERVICE

Figure 3-16
TRANSIT SERVICE FACILITIES

Figure 3-17
AIRPLANE FACILITIES

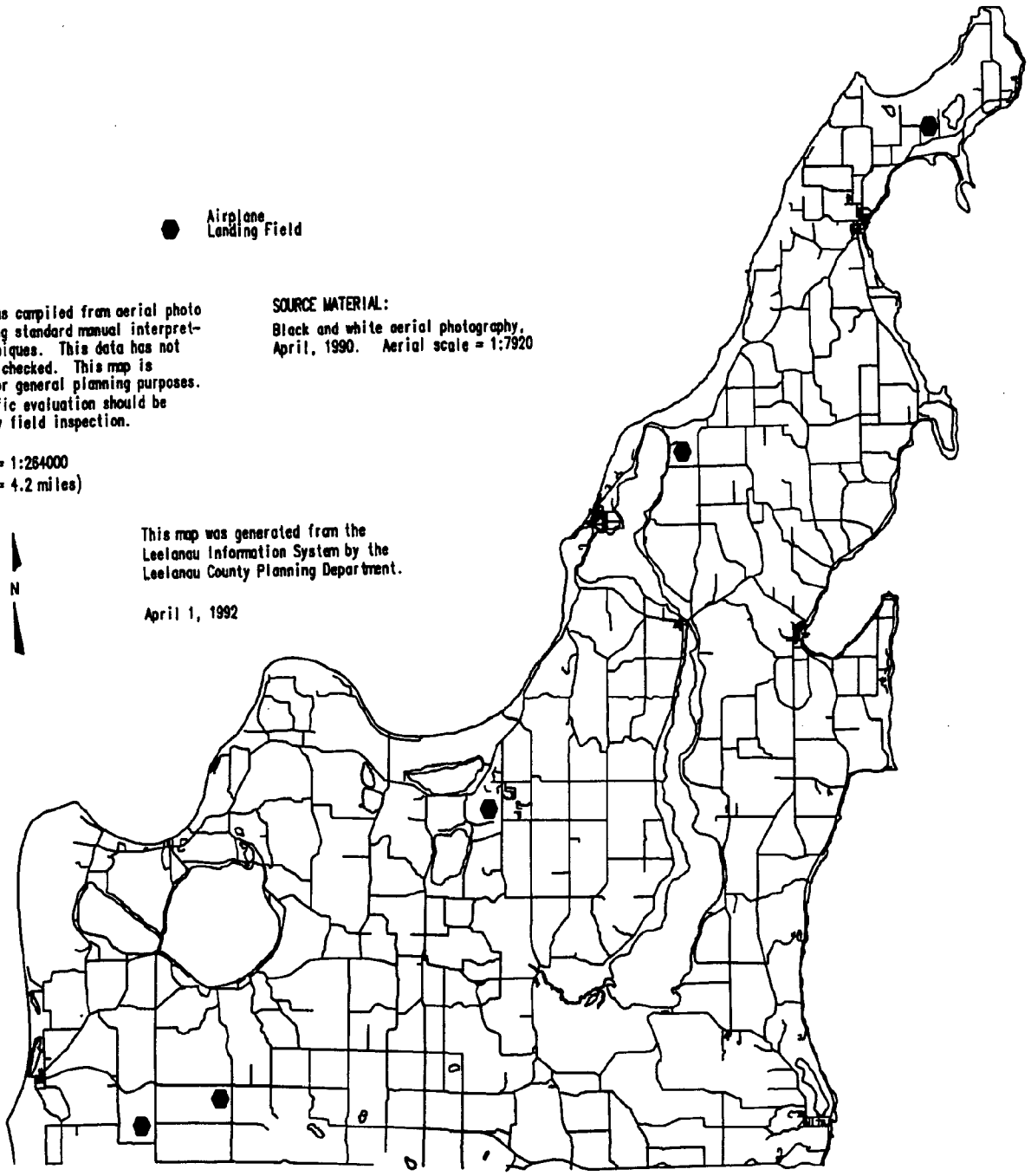

Figure 3-18
RAILROAD FACILITIES

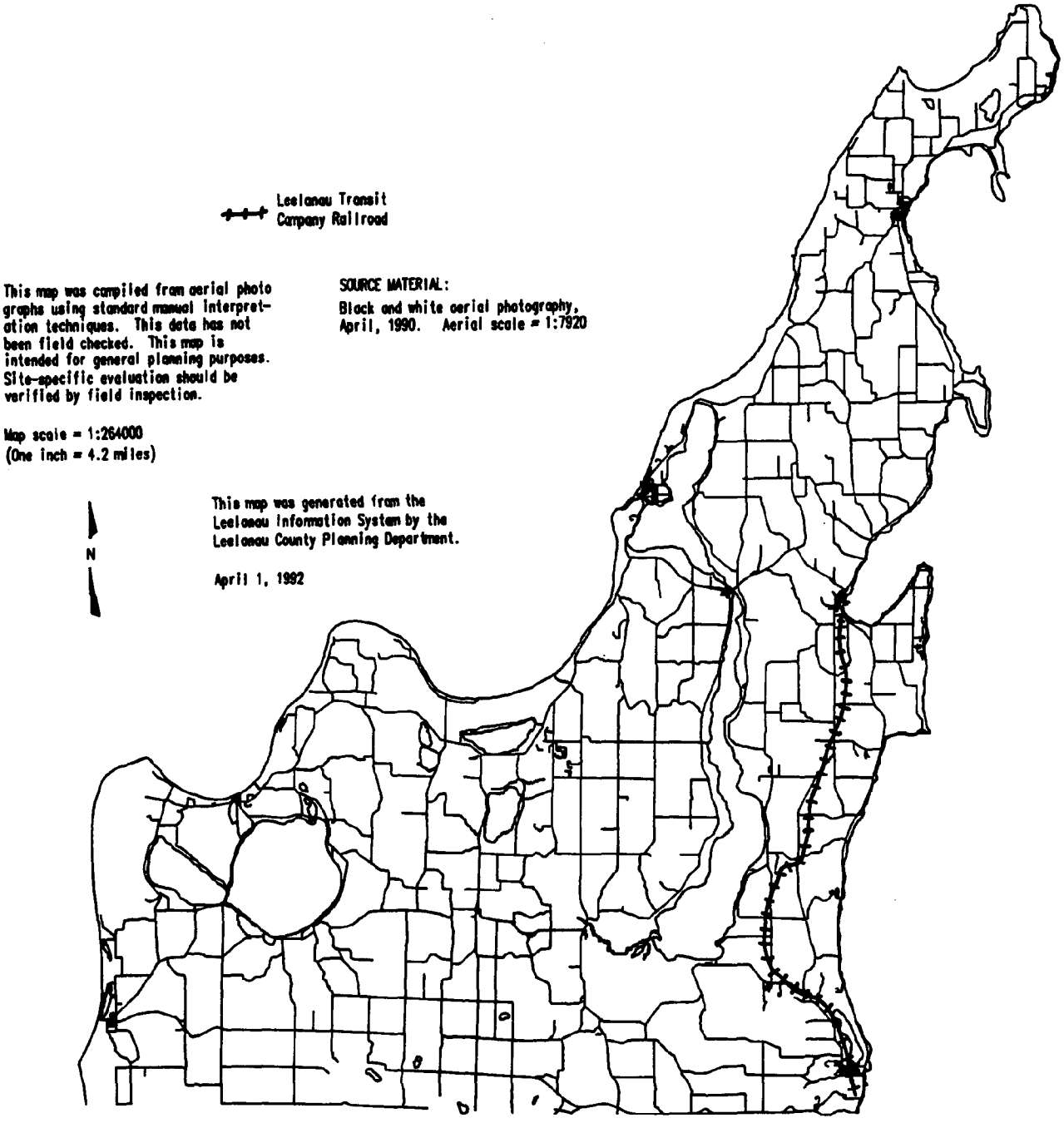

Figure 3-19
BICYCLE FACILITIES

Figure 3-20
PEDESTRIAN FACILITIES

Figure 3-20a
PEDESTRIAN FACILITIES
LELAND

Road

Sidewalk

This map was compiled from aerial photographs using standard manual interpretation techniques. This data has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:

Black and white aerial photography, April, 1990. Aerial scale = 1:7920

Map scale = 1:15840
(One inch = 1/4 mile)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department

April 1, 1992

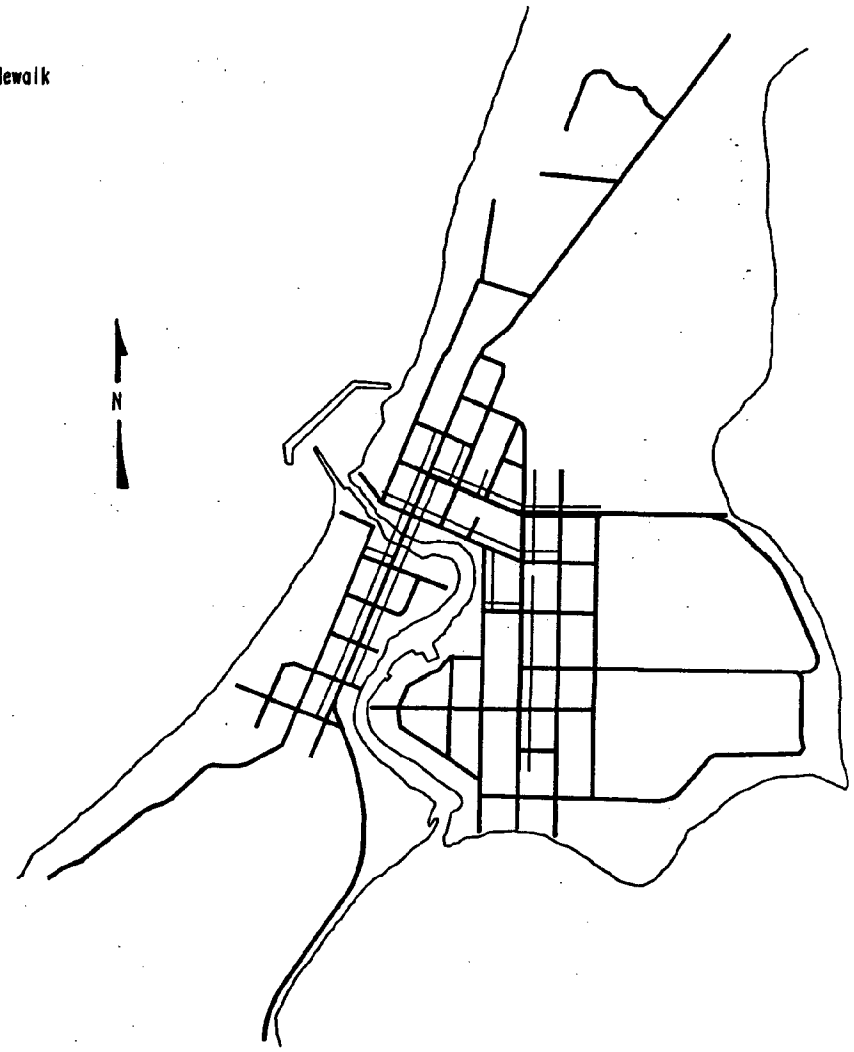

Figure 3-20b
PEDESTRIAN FACILITIES
NORTHPORT

Road

Sidewalk

This map was compiled from aerial photo graphs using standard manual interpret-ation techniques. This data has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:
Black and white aerial photography, April, 1990. Aerial scale = 1:7920

This map was generated from the Leelanau Information System by the Leelanau County Planning Department

April 1, 1992

Map scale = 1:1760
(One inch - app 1/3 mile)

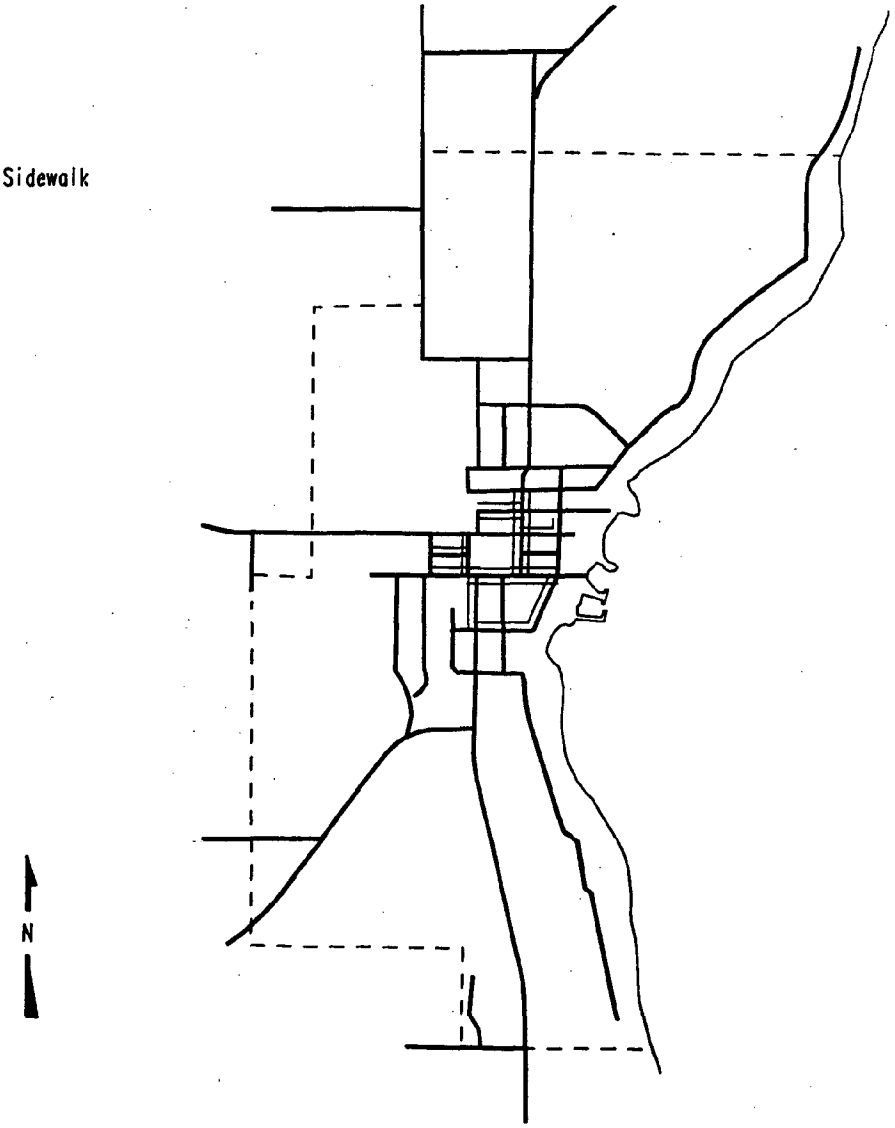

Figure 3-20c
PEDESTRIAN FACILITIES
SUTTONS BAY

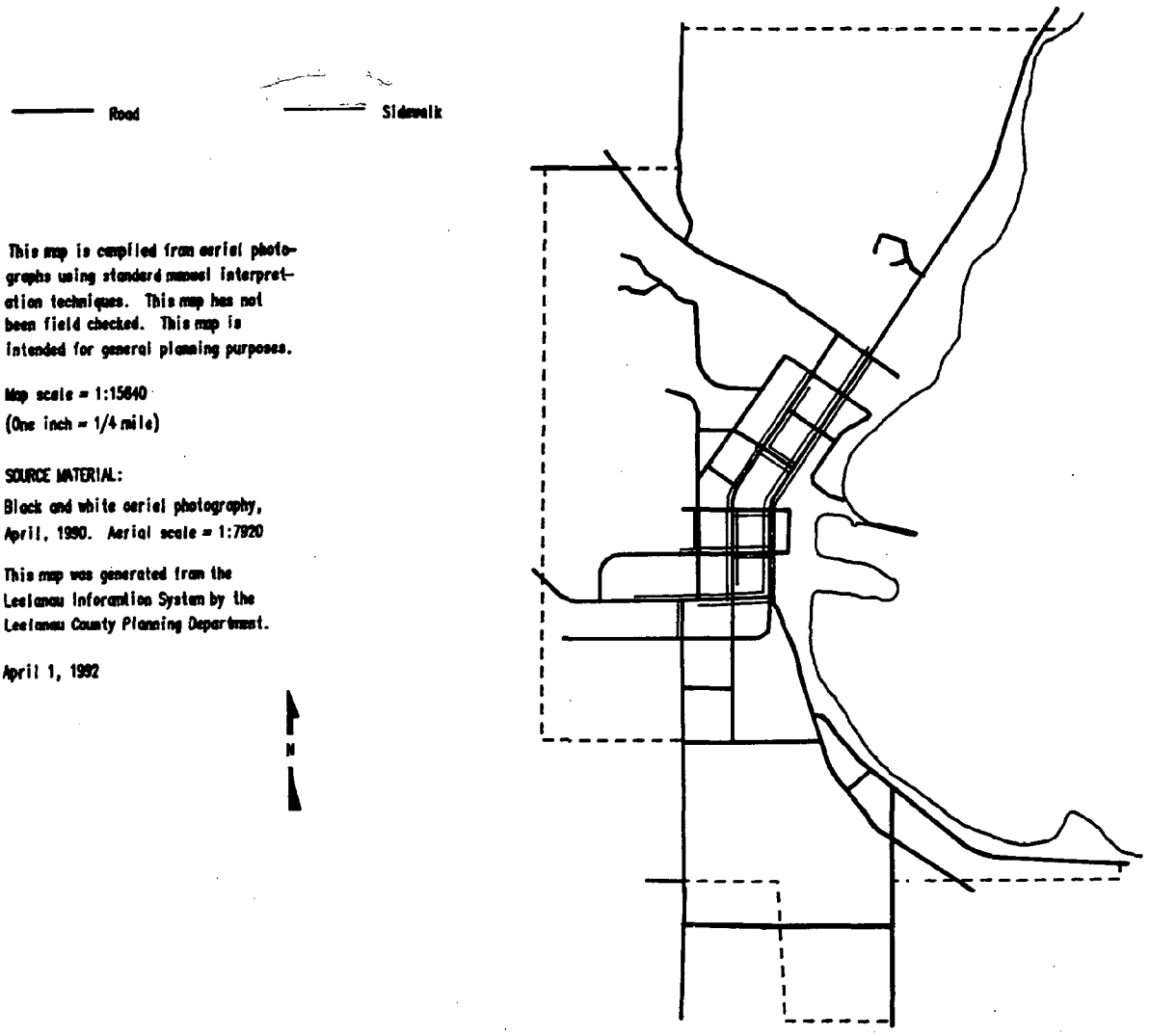

Figure 3-20d
PEDESTRIAN FACILITIES
EMPIRE

Road Sidewalk

This map was compiled from aerial photographs using standard manual interpretation techniques. This data has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:
Black and white aerial photography (April, 1990). Aerial scale = 1:7920

Map scale = 15840
(One inch = 1/4 mile)

This map was generated from the Geolanau Information System by the Geolanau County Planning Department.

April 1, 1992

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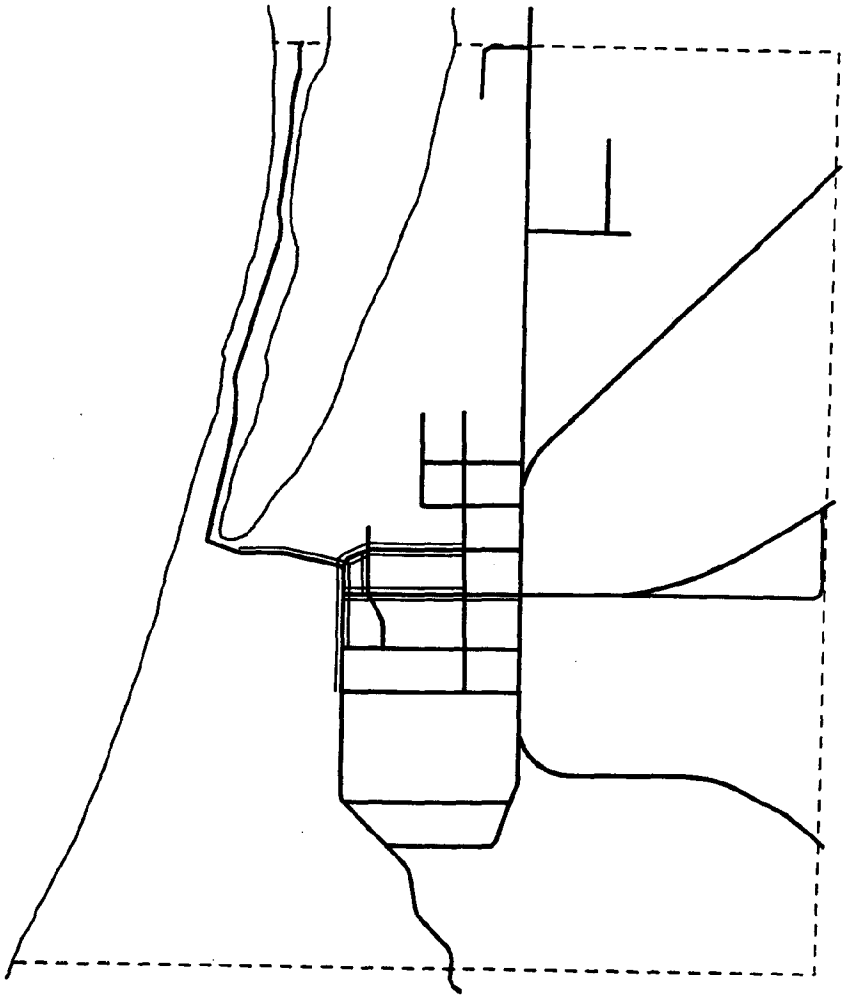

Figure 3-20e
PEDESTRIAN FACILITIES
LELAND

Road

Sidewalk

This map was compiled from aerial photographs using standard manual interpretation techniques. This data has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:

Black and white aerial photography, April, 1990. Aerial scale = 1:7920

Map scale = 1:15840
(One inch = 1/4 mile)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department

April 1, 1992

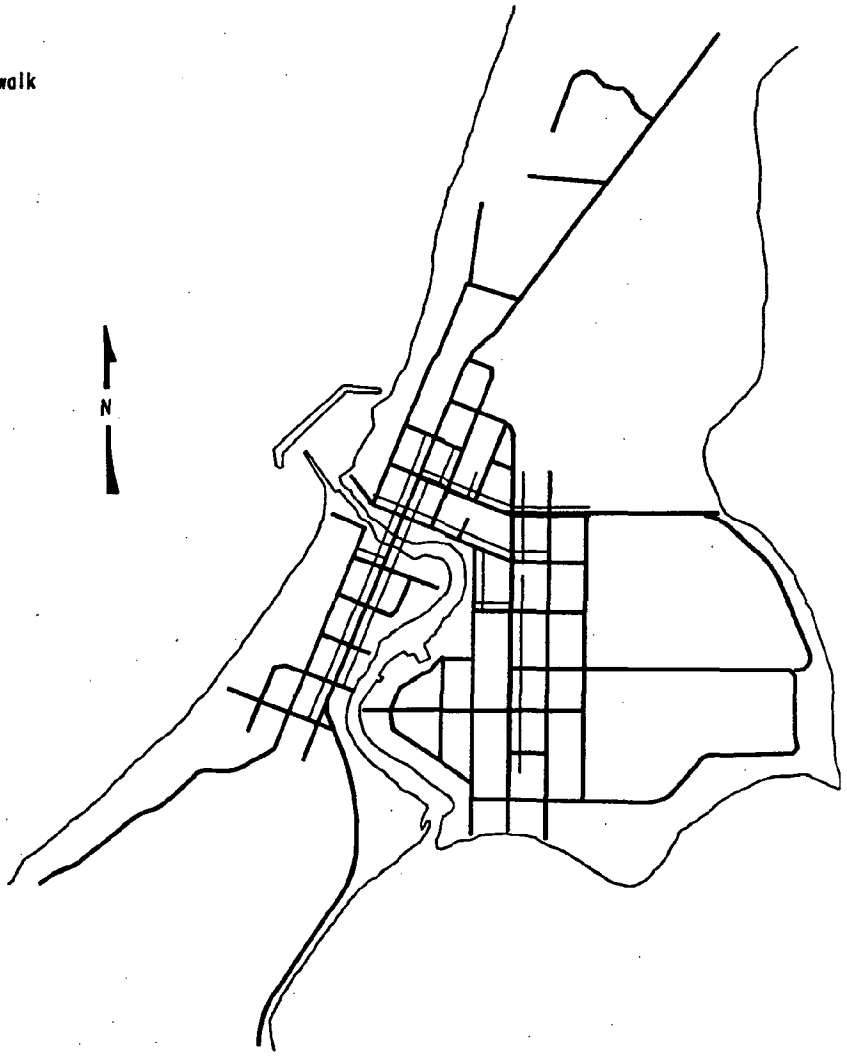

Figure 3-20f
PEDESTRIAN FACILITIES
LAKE LEELANAU

Road Sidewalk

This map was compiled from aerial photographs using standard manual interpretation techniques. This map has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:

Black and white aerial photography, April, 1990. Aerial scale = 1:7920

Map scale = 1:15840
(One inch = 1/4 mile)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department.

April 1, 1992

Figure 3-20g
PEDESTRIAN FACILITIES
CEDAR

Road Sidewalk

This map was compiled from aerial photographs using standard manual interpretation techniques. This map has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:
Black and white aerial photography
April, 1990. Aerial scale = 1:7920

Map scale = 1:7920
(One inch = 660 feet)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department.

April 1, 1992

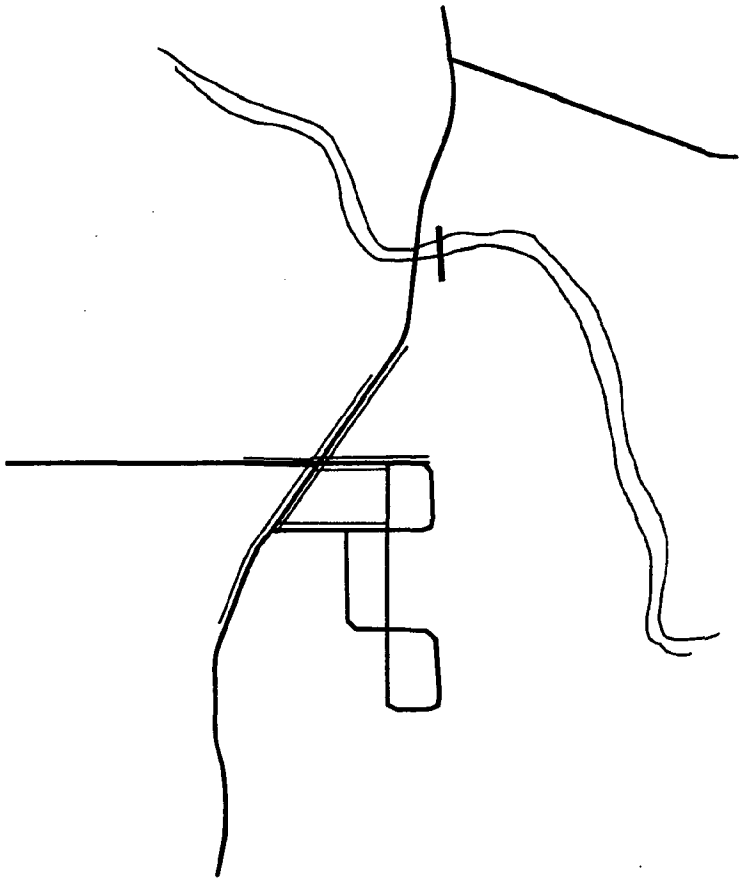

Figure 3-20h
PEDESTRIAN FACILITIES
MAPLE CITY

Road

Sidewalk

This map was compiled from aerial photographs using standard manual interpretation techniques. This map has not been field checked. This map is intended for general planning purposes.

SOURCE MATERIAL:
Black and white aerial photography
April, 1990. Aerial scale = 1:7920

Map scale = 1:7920
(One inch = 660 feet)

This map was generated from the Leelanau Information System by the Leelanau County Planning Department.

April 1, 1992

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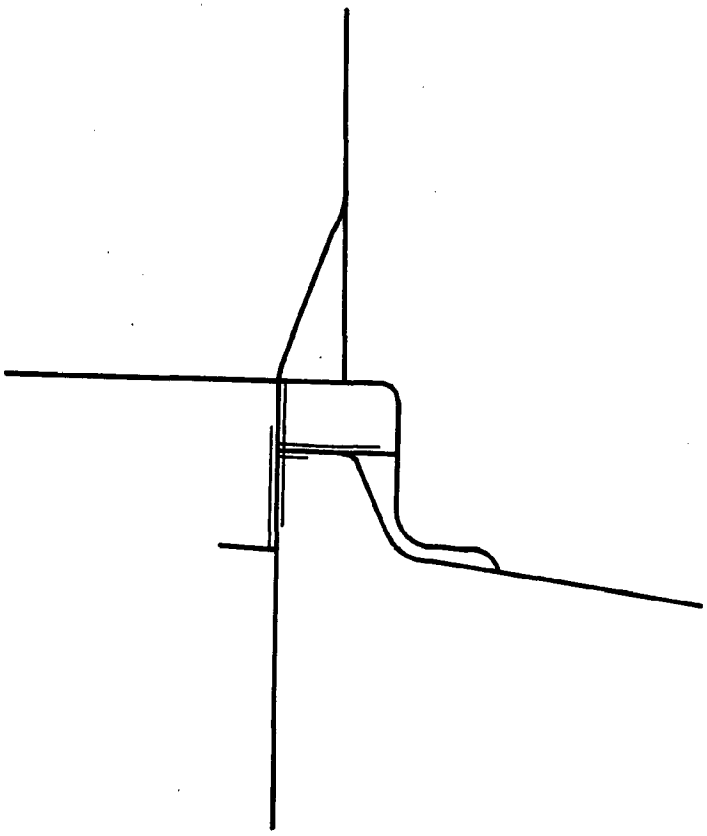
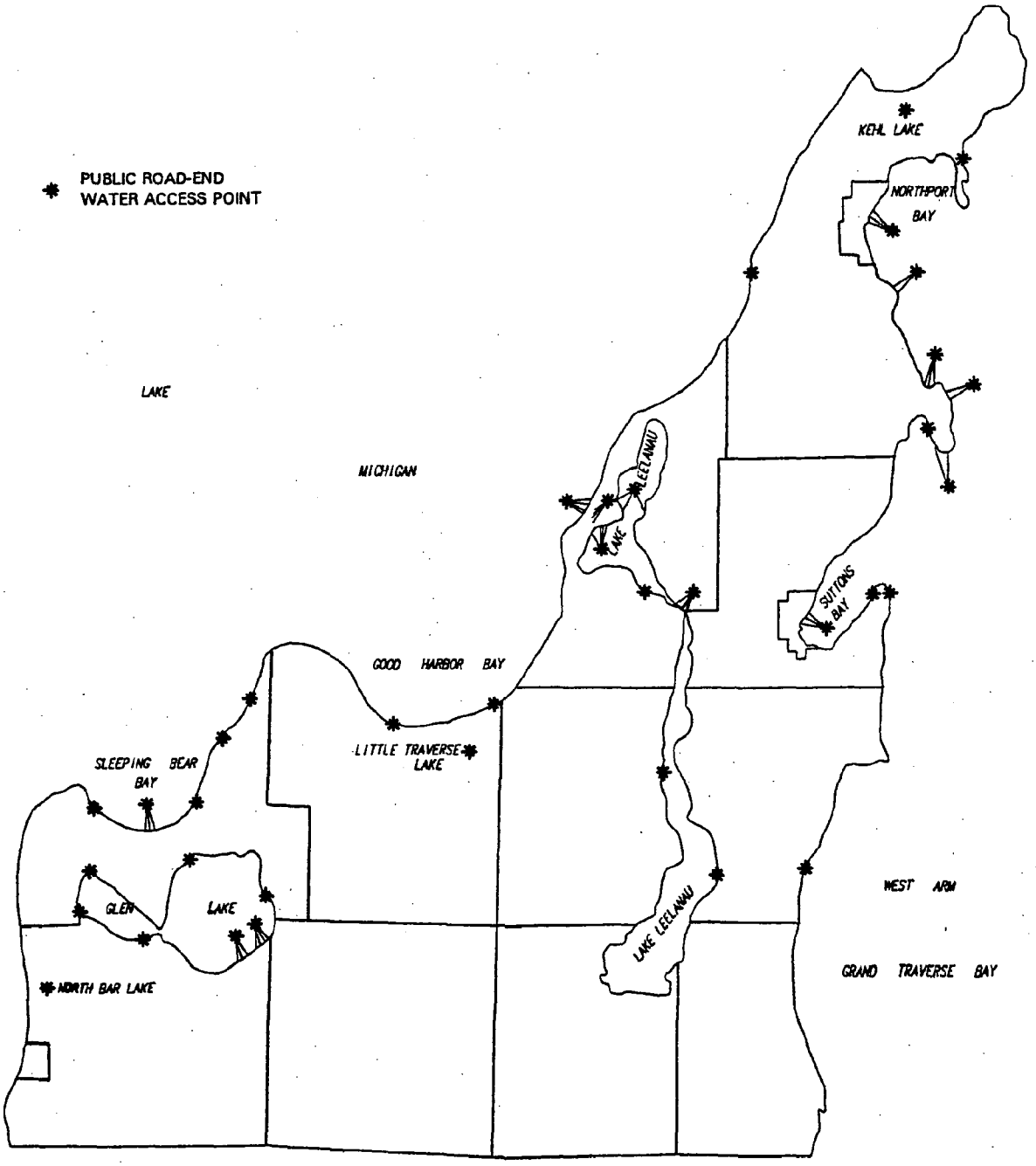


Figure 3-21
ROAD ENDS AT WATER BODIES



Chapter 4

SCHOOLS

The residents of Leelanau Peninsula are provided public education services through five independent school districts (see Figure 4-1). These districts are:

- Glen Lake Community Schools
- Leland Public Schools
- Northport Public Schools
- Suttons Bay Public Schools
- Traverse City Public Schools

All districts maintain facilities within the Peninsula. Traverse City Area Public Schools provide public education services to residents of Elmwood and Solon Townships and operate the Norris Elementary School in Elmwood Township.

Table 4-1 identifies the number of school facilities and enrollments for each of the five school districts that maintain facilities within the Peninsula.

The school districts of Suttons Bay and Glen Lake are significantly larger in enrollment of the four districts and each maintains two distinctly different facilities for their respective grade spans. Both of the school districts of Leland and Northport operate single facilities which jointly serve the needs of their three grade spans. The Glen Lake Public Schools District covers an area nearly as large or larger than the other three districts combined.

Table 4-1
PUBLIC SCHOOL FACILITIES IN LEELANAU COUNTY

	GLEN LAKE COMMUNITY SCHOOLS	LELAND PUBLIC SCHOOLS	NORTHPORT PUBLIC SCHOOLS	SUTTONS BAY PUBLIC SCHOOLS	TRAVERSE CITY AREA PUBLIC SCHOOLS
NUMBER of SCHOOL FACILITIES	2	1	1	2	1[c]
GRADE SPANS					
Elementary	X	X	X	X	X
Middle	0	X	X	0	X
Senior	X	X	X	X	X
SCHOOL ENROLLMENT	740	359	279[a]	875	4664[d]
ENROLLMENT CAPACITY	720	485[b]	357	950	4000

a - projected 1993
b - approximate
c - junior and senior high school facilities are located in Traverse City
d- of the 4664 enrolled, 747 are from Leelanau Co.

There are six private school facilities in the Peninsula. Table 4-2 lists these facilities and associated enrollment/capacity data. Figure 4-2 identifies the location of all private school facilities in the county.

EMERGING ISSUES

Though the school districts of Northport Schools and Leland Schools have considerable excess enrollment capacity, the school districts of Suttons Bay and Glen Lake find themselves in a different situation. Even after the recent expansion of the Suttons Bay School District facility, current enrollment is within 10% of the district's total capacity. Future growth and development will surely place additional strains upon these school districts. The Glen Lake School District is cur-

rently operating within an excess demand condition. Future growth and development could place enormous pressures upon both of these districts and negatively impact the quality of education. Though the Leland and Northport school districts have additional capacity to accommodate short term future growth, long term implications are not nearly so clear in light of past growth trends in the County. All of these four school districts may find themselves facing questions regarding future expansions and new facilities.

ITEMS FOR DISCUSSION

1) Future planned growth and development patterns must be linked to the need, ability, and schedule of area school districts to implement facility renovations, expansions, and new facility construction to avoid excess enrollment demand and decreases in education quality, or alternatively higher taxes to fund new school facilities.
2) The siting of new future school facilities should recognize the benefits of close-to-home facilities, including: 1) decreased bussing, traffic generation, and energy consumption; 2) increased sense of community; and 3) increased accessibility to school related community services, including recreation facilities.

Table 4-2
PRIVATE SCHOOL FACILITIES

School	Enrollment	Capacity
Holy Rosary, Cedar	31	100-120
Leelanau Schools Glen Arbor	100	100-125
Montessori Children's House, Suttons Bay	43*	37
Montessori Elementary School, Suttons Bay	21	30
Pathfinder, Elmwood Township	144	150-160
St. Marys, Lake Leelanau	157	250

* staggered time enrollments

Figure 4-1a
GLEN LAKE COMMUNITY SCHOOL DISTRICT AND FACILITIES

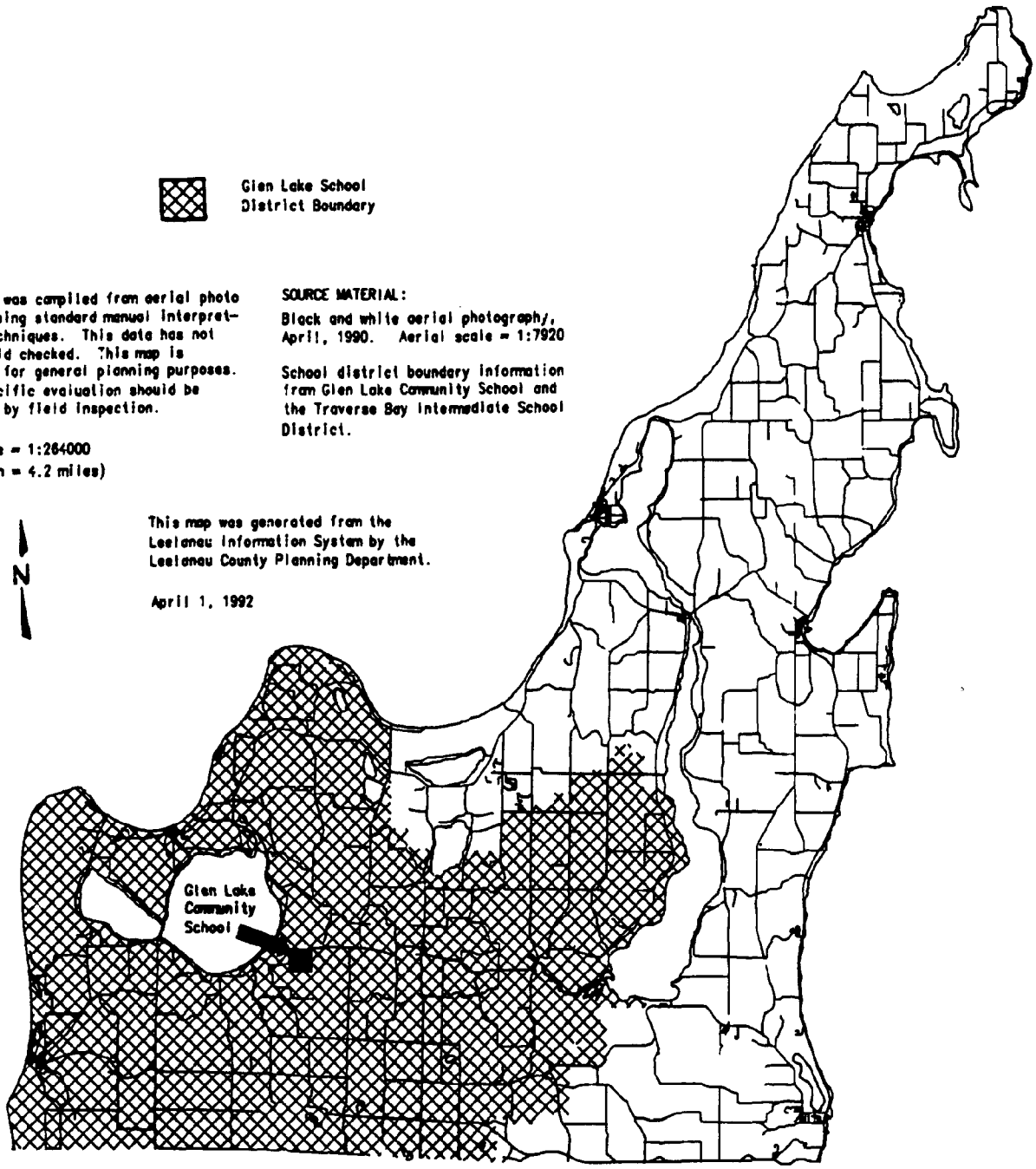


Figure 4-1b
LELAND PUBLIC SCHOOL DISTRICT AND FACILITIES

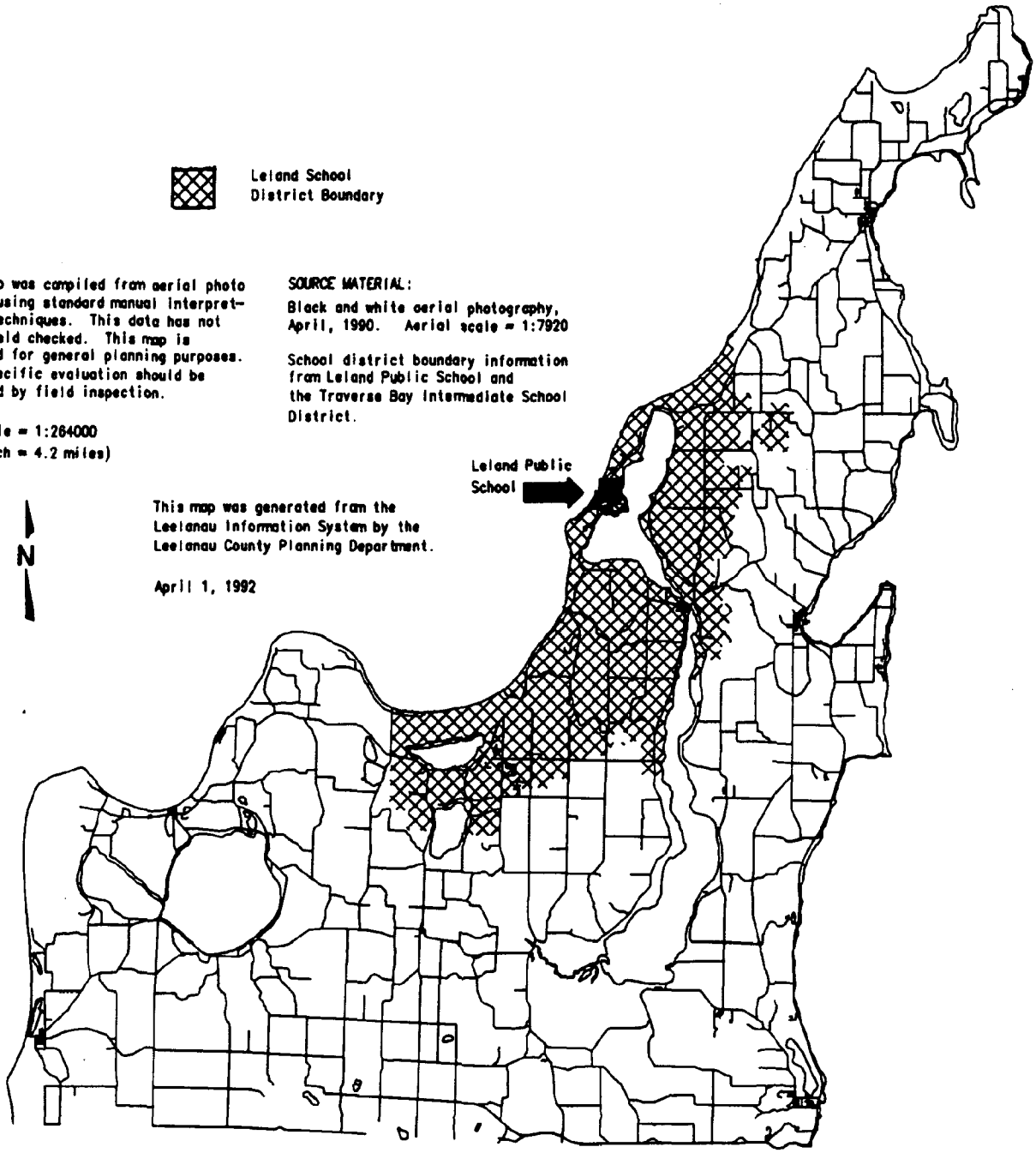


Figure 4-1c
NORTHPORT PUBLIC SCHOOL DISTRICT AND FACILITIES

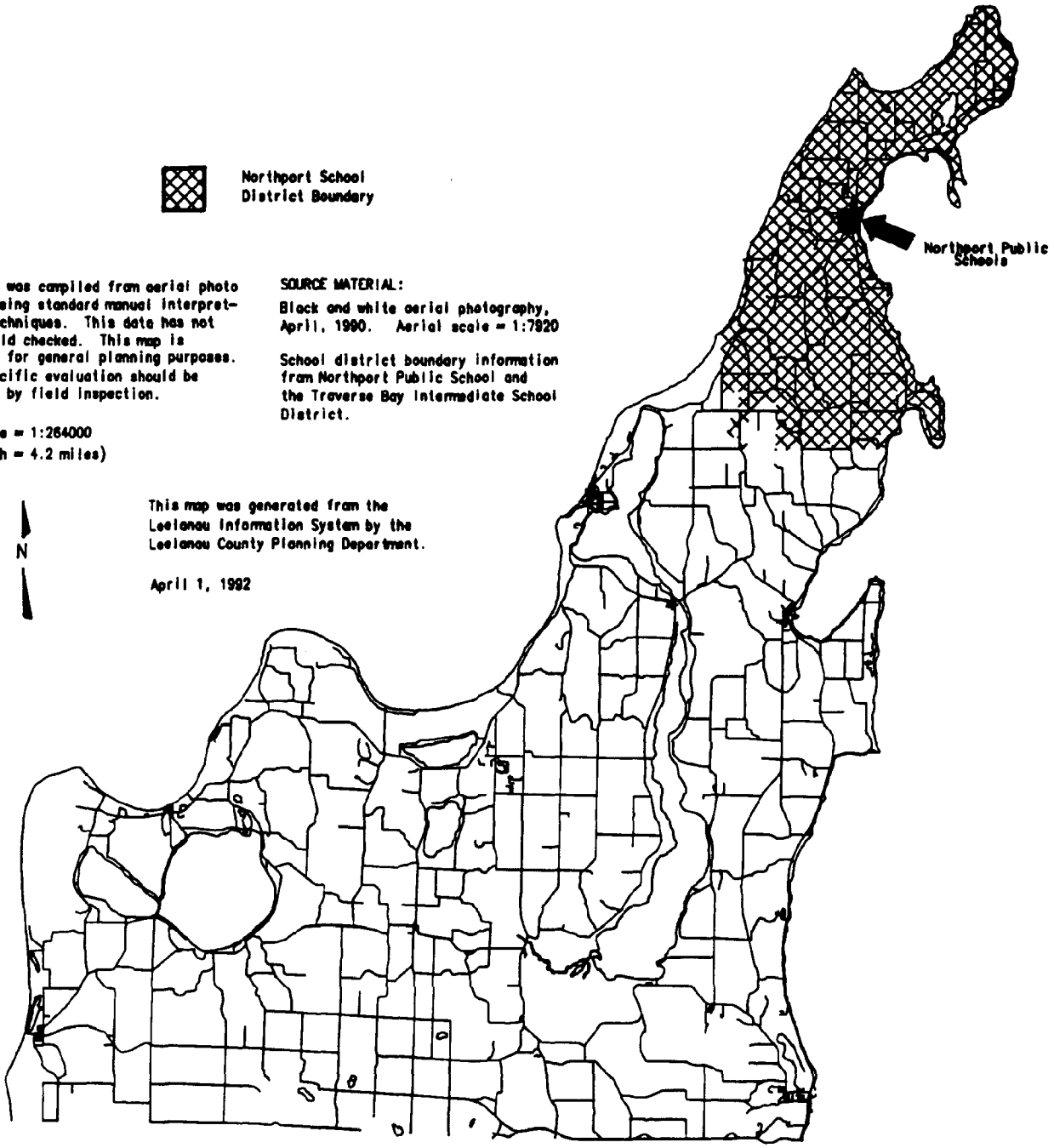


Figure 4-1d
SUTTONS BAY PUBLIC SCHOOL DISTRICT AND FACILITIES

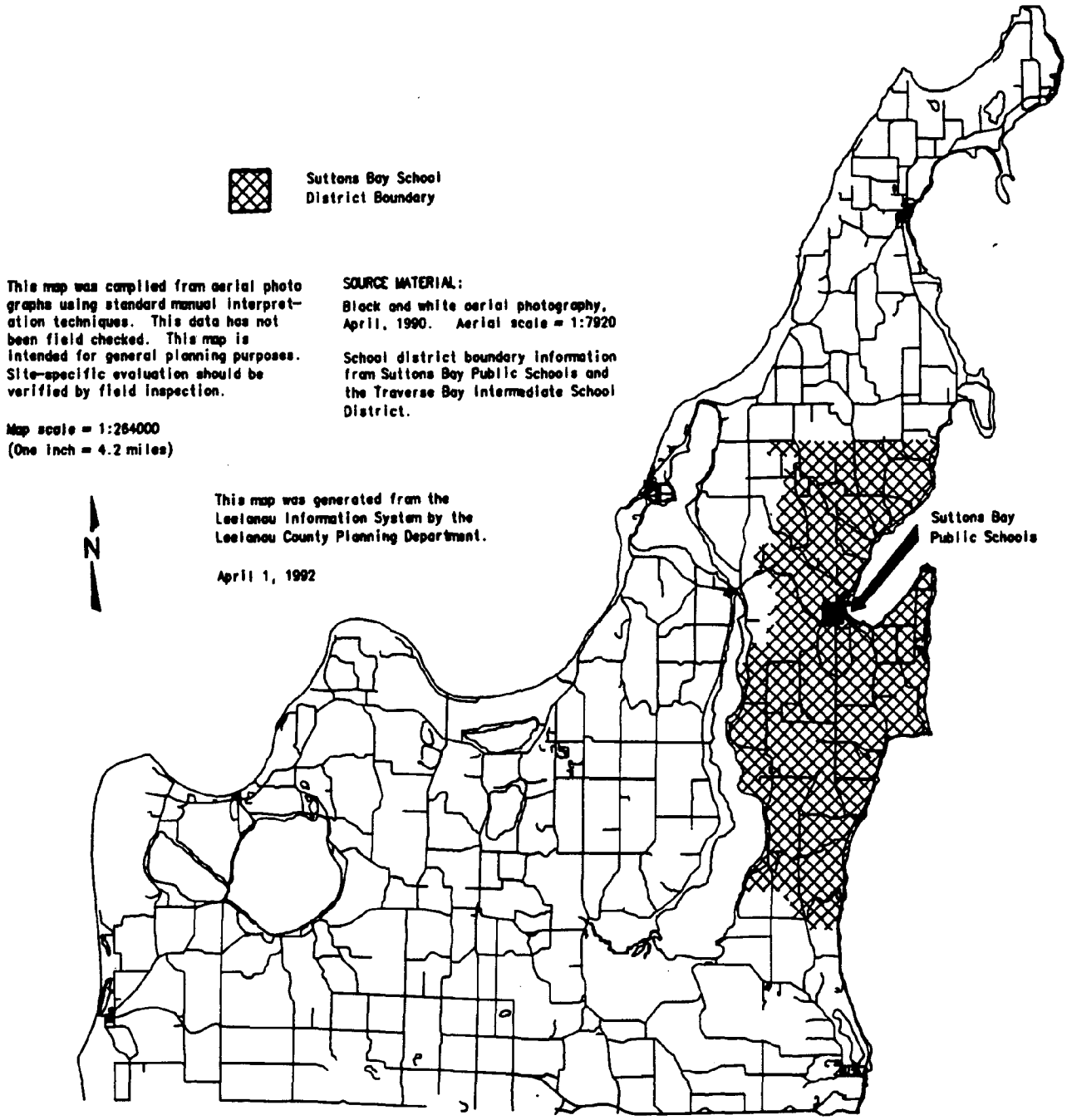


Figure 4-1e
TRAVERSE CITY AREA PUBLIC SCHOOL DISTRICT AND FACILITIES

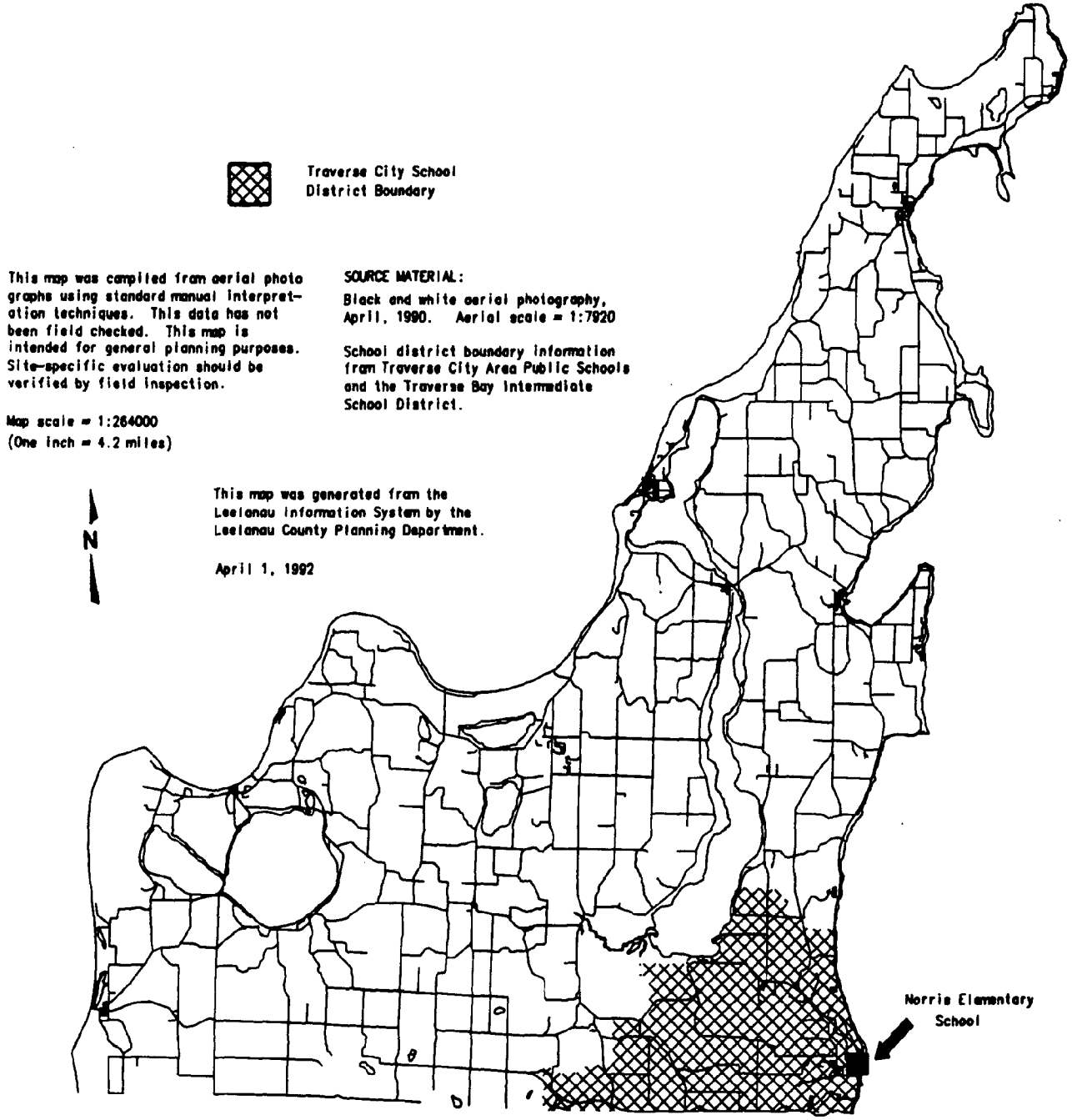
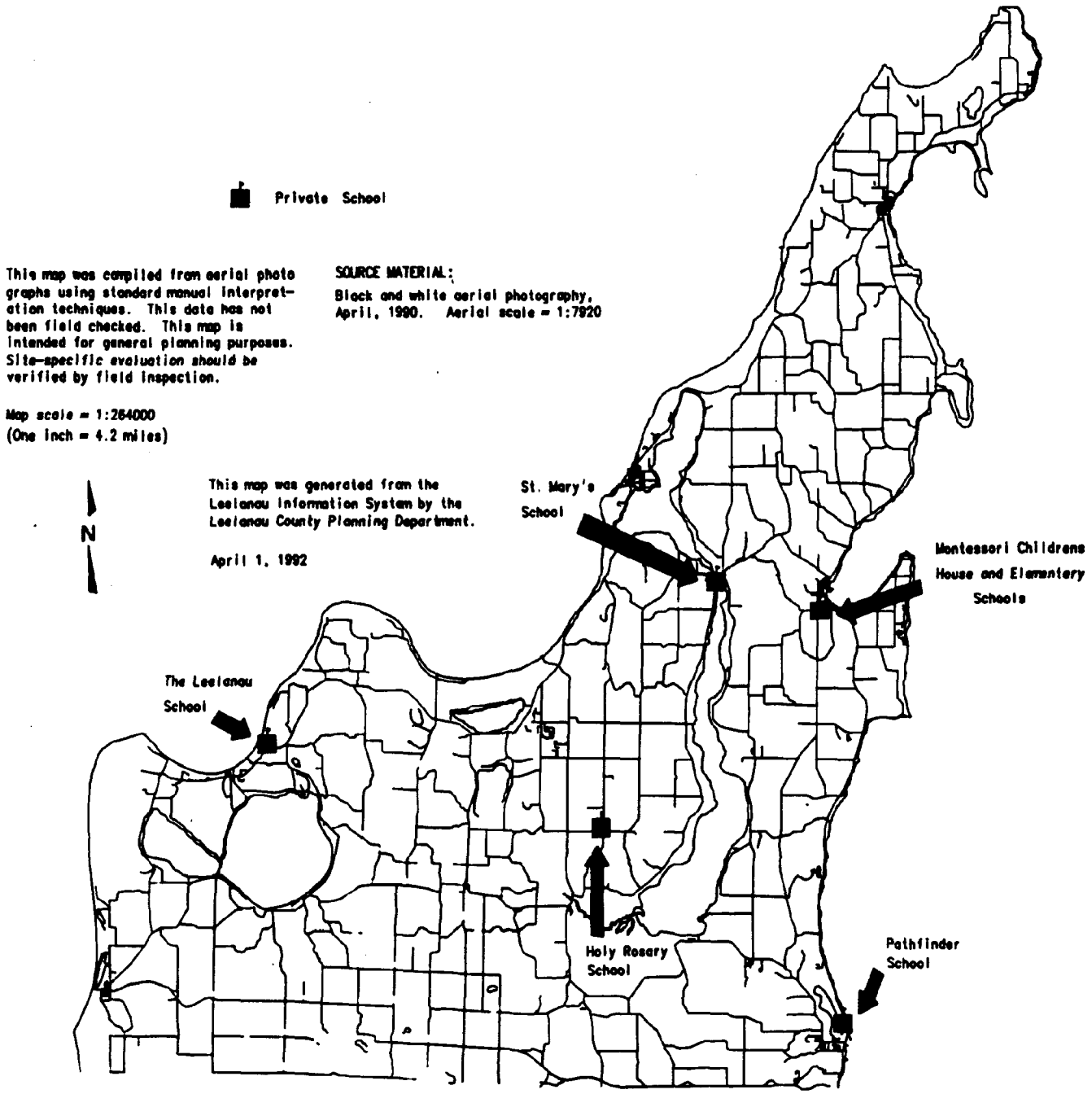


Figure 4-2
PRIVATE SCHOOLS
AND FACILITIES



Chapter 5

NONMUNICIPAL PUBLIC SERVICES

INTRODUCTION

Essential services are not provided by the public sector exclusively. Electrical service, telephone service, and medical services are examples of important community services for which the private sector is usually the provider. This chapter reviews some of the community services provided by the public sector within the Leelanau Peninsula including electricity and gas, communications, and medical services.

Figure 5-1 identifies the location of all gas, electric, telephone and related support facilities.

ELECTRICITY

Electricity is provided to the Peninsula by two utility companies: Consumer's Power Company and Cherryland Rural Electrical Cooperative Association. Consumer's Power Company is responsible for transmitting electricity to the numerous substations located in the Peninsula. Cherryland Rural Electrical Cooperative, Inc. then distributes the electrical service from the substations to individual residences and establishments.

Consumer's Power Company

Consumer's Power Company provides electrical service to all local municipalities in the Peninsula. The electricity provided to the Peninsula by Consumer's Power Company is produced in Ludington and Charlevoix and transmitted throughout the Peninsula via two overhead transmission lines (see Figure 5-1). Each of the transmission lines carries 46,000 volts and follow a parallel alignment from Traverse City to Section 29 of Elmwood Township, where a substation is situated. From this point, the transmission lines extend into the interior areas of the Peninsula. The longer of the two lines follows a general alignment from Hatches Crossing to the Village of Northport, ranging from within approximately three and a half miles (in Leelanau Township) to less than a quarter mile (in Village of Suttons Bay) of the Grand Traverse Bay shoreline. A substation is located in the Village of Suttons Bay and the Village of Northport. The second primary transmission line follows a general alignment from Solon to Glen Arbor, where another substation is located. From this line extends a short one and a half mile 46 KV line to Maple City, where the fifth of five substations in the Peninsula is located.

Consumer's Power Company does not maintain any administrative offices within the Peninsula, the closest being in Traverse City. The Company's principal administrative offices are based in Jackson, Michigan.

Cherryland Rural Electric Cooperative, Inc.

Cherryland Rural Electric Cooperative, Inc. is one of seven members of the Wolverine Power Supply Cooperative, Inc., a nonprofit electric generation and transmission cooperative based in Cadillac, Michigan. Cherryland Rural Electric Cooperative, Inc. is based in Grawn, Michigan. The cooperative does not maintain any administrative offices within the Peninsula, and its infrastructure is limited to the individual service lines providing electrical service from area substations to residences and other establishments within all but three (Cleveland Township, Glen Arbor Township, and Empire Village) of the 14 municipalities in the Peninsula.

NATURAL GAS

Michigan Consolidated Gas Company

All natural gas service in the Peninsula is provided by Michigan Consolidated Gas Company. This service is limited to four of the 14 Peninsula municipalities including the townships of Bingham, Elmwood, and Suttons Bay, and the Village of Suttons Bay. It is through these four communities that Michigan Consolidated Gas Company's single gas pipeline extends. The six-inch main originates in Grand Traverse County and extends into the Leelanau Peninsula along M-22 as far north as Suttons Bay. Properties along M-22 south of Suttons Bay feed directly off this six-inch main. The main terminates at a regulator vault in Suttons Bay, where smaller branch lines and service lines originate and carry the gas to the customers.

The source of the gas varies upon regional conditions and includes both Michigan, out-of-state (U.S.), and Canadian produced gas. Much of the gas distributed to the Peninsula is initially stored by Michigan Consolidated Gas Company at a facility in Osceola County.

Michigan Consolidated Gas Company does not maintain any administrative offices within the Peninsula, though it does operate a customer business and service center in Traverse City. The Company's principal administrative offices are based in Detroit, Michigan.

COMMUNICATIONS

Century Telephone Company

Century Telephone Company provides telephone service to the entire Peninsula except for the communities of Lake Leelanau, Leland, Northport, and Grielickville. Century Telephone Company is a subsidiary of Century Telephone Enterprises based in Monroe, Louisiana. Divisional headquarters are situated in Maple City, Michigan, and these offices are the only facilities operated by the company within the Peninsula, except for the telephone lines themselves. The company operates both aboveground and underground transmission lines.

Michigan Bell Telephone Company

Michigan Bell Telephone Company provides telephone service to the communities of Lake Leelanau, Leland, Northport, and Grielickville.

Century Cellunet, Incorporated

Century Cellunet, Incorporated provides cellular phone service within a geographical area generally covering the eastern half of the Peninsula south of Suttons Bay. Though its services may be available in other portions of the Peninsula where the topography and elevations are favorable, it is far less reliable. A subsidiary of Century Telephone Enterprises in Louisiana with a branch office in Traverse City, the company does not operate or maintain any physical facilities in the Peninsula. The nearest transmitting tower is situated just west of Traverse City.

Cellular One

Cellular One Phone Company, with its main offices in Traverse City, does not maintain any facilities, including towers, in the Peninsula. Its closest tower to the Peninsula is in Traverse City, but provides only limited and random service to the Peninsula itself due to the tower's transmitting pattern. The company is considering expanding service in the Peninsula through the establishment of several towers in the near future.

Grand Traverse Broadcasting Company

Grand Traverse Broadcasting Company, based in Leland, operates the VVTRV FM radio station by way of a 82-foot high transmitting tower atop Sugarloaf Mountain in Cedar. The signal is broadcast at a frequency of 94.3, and the signal is transmitted over an approximately 35-mile radius. WTRV simulcasts the radio signal of WAIR which is located in Johannesburg, Michigan, east of Gaylord.

Rentals Communication

Rentals Communication, based in Cheboygan, operates the WGFM radio station and utilizes a 250-foot tower located just outside of Glen Arbor. The signal is broadcast at a frequency of 98.1 FM, and the signal is transmitted over an approximately 75-mile radius.

Good News Media Incorporated

Good News Media Incorporated, based in Traverse City, operates the WLJN radio station by way of a 300-foot tower along M-72 atop Morgan Hill in Elmwood Township. The signal is broadcast at a frequency of 89.9 FM/1400 AM, and the signal is transmitted over an approximately 60-mile radius.

Federal Broadcasting Company

Federal Broadcasting Company, based in Detroit, operates the WPBN television station by way of a 465-foot tower located along M-72 in Elmwood Township. The signal is broadcast on channels 4 and 7, and is transmitted over an approximately 75-mile radius. The station is an affiliate of NBC.

CMU Public Television

Central Michigan University, based in Mt. Pleasant, operates the CMU Public Television station by way of a 90-foot tower. The signal is broadcast on channel 46, and the signal is transmitted over an approximately 150-mile radius. The station is an affiliate of PBS.

TV CABLE

Cable TV service is provided to the Peninsula by three cable companies. C-Tech Cable Systems of Michigan, Incorporated provides cable service to 2,890 subscribers throughout the Peninsula, and maintains central transmitting facilities in section 21 of Empire Township and along County Route 633 just south of Suttons Bay. These facilities receive the cable signal and then transmit the signal to individual subscribers via aboveground and belowground lines. C-Tech Cable System of Michigan, Incorporated is a subsidiary of C-Tech Corporation and maintains administrative offices in Traverse City.

Westmark Cable Company and Village Cable Company also operate on the Peninsula, the latter principally serving the Northport Village Area.

HEALTH FACILITIES AND SERVICES

Leelanau Memorial Hospital

Leelanau Memorial Hospital is the single primary health facility in the Peninsula and is affiliated with Munson Medical Center in Traverse City. The hospital is located in the Village of Northport and was constructed in 1953. The hospital provides a full range of medical care facilities including in-patient and out-patient services, specialized senior citizens care, emergency room facilities, laboratory and X-ray facilities, and obstetrics and operating room facilities. The hospital consists of four primary building facilities:

1) Acute Care Unit, consisting of approximately 19,400 square feet within a one story (with partial basement) brick structure constructed in 1957.
2) Storage Building and Garage, consisting of approximately 2,400 square feet within a one story structure constructed in 1959.
3) Medical Office Building, consisting of approximately 4,900 square feet within a two story structure constructed in 1969.
4) Long Term Care Unit, consisting of approximately 32,100 square feet within a two story structure constructed in 1971.

The Acute Care Unit includes 33 beds of which all are rarely in use. The Long Term Care Unit includes 61 beds, is generally always full, and used principally for senior citizens. The hospital is licensed by the Michigan Department of Public Health and the Department of Social Services.

OTHER MEDICAL FACILITIES AND SERVICES

Other medical facilities and services in the Peninsula include:

- 4 private dental offices, located principally in Suttons Bay and Leland.
- 7 private clinics and doctors, located throughout the Peninsula, practicing in the areas of psychiatry, optometry, and general medicine.
- Maple Valley Nursing Home, situated in Maple City.

The Grand Traverse/Leelanau Community Mental Health Services facility is situated in Suttons Bay.

EMERGING ISSUES

The aging Peninsula population and limited hospital facilities in the County may bring more demand for more convenient health care facilities. However, the trend is to fewer, larger and more affiliated health care facilities, rather than new hospital facilities in new unserved areas. Traverse City is likely to remain the center for hospital based health care facilities.

Improved natural gas, electric and telephone communication facilities will make the Peninsula more attractive for a broader range of and more intensive land developments. Without more all-weather roads, however (see Chapter 3), this may not be attractive to industrial development activities.

Improved communication systems may open up even more opportunities for computer-based home occupations. This would facilitate more high tech "white collar" employment in the County without the road impacts of more commuters.

ITEMS FOR DISCUSSION

1) Leelanau Hospital is a comparatively small medical facility and, yet, is the primary health facility on the Peninsula. The facility's small size makes it that much more vulnerable to the rising costs of services. It is unclear as to how the future economic conditions within which the hospital operates will impact medical care on the Peninsula. The availability of convenient hospital services may become increasingly limited as certain medical services are cut back, dropped, and/or priced beyond the reach of many.
2) To what extent, if any, should efforts be made to further encourage improved natural gas, electric and telephone services given to the growth inducing aspects of such services?

Figure 5-1
NONMUNICIPAL PUBLIC SERVICES

Chapter 6

SOLID WASTE MANAGEMENT

INTRODUCTION

This chapter reviews the solid waste management services and facilities in existence in Leelanau County. In accordance with the Leelanau County Solid Waste Management Plan, there are four basic services available in the County: the collection and disposal of solid wastes by landfilling; the collection of recyclables for processing; the periodic collection of household hazardous wastes for disposal at an appropriately licensed facility; and ongoing public information and education programs associated with solid waste management. This chapter also reviews the solid waste stream and other programs suggested in the Solid Waste Management Plan.

FACILITIES AND PHYSICAL SERVICES

Landfill

Until September, 1983 almost all of the solid waste collected in Leelanau County was ultimately disposed of at the Leelanau County Landfill. That landfill was closed on September 30, 1983. After that date, the haulers serving Leelanau County began disposing of collected waste at Glen's Sanitary Landfill. Glen's is located in southern Kasson Township on Traverse Hwy. (M-72) (see Figure 6-7). Major wastes not being disposed of at the landfill include:

- recyclable materials removed from the waste stream by source separation.
- agricultural wastes being composted.
- some burning of wastes by individuals.
- some backyard disposal by individuals.

With a total of 294 acres of land presently undeveloped, the landfill has a considerable life expectancy. An assessment of the site's capacity performed in 1988 indicated that the facility has a remaining life of fifty years. A reassessment of the site's capacity will be included in each update of the Leelanau County Solid Waste Management Plan.

Solid Waste Haulers

Leelanau County is presently serviced by six (6) solid waste haulers, three of whom are based in Leelanau County. No municipalities within the County provide solid waste collection service to their residents. Table 6-1 lists the haulers that operate in the County. Figures 6-1 through 6-6 show the approximate areas served by each hauler.

In addition to the commercial haulers, there are additional haulers that collect solid wastes and dispose of them at Glen's Sanitary Landfill. Most of these haulers are contractors who haul construction wastes. These haulers are listed in Table 6-2.

Recycling Drop-off Sites

Introduced in 1987, the Leelanau County recycling program began with one drop-off site in Suttons Bay. Sites in Cedar, Empire,

TABLE 6-1

Private Solid Waste Haulers Serving Leelanau County

Hauler	Base of Operation	Equipment	Service Area	Type of Pickup	Approximate No. of Customers	Disposal Site
Cedar Disposal	Cedar	(1) 20 cu yd Packer (1) 17 cu yd Packer (1) 16 cu yd Packer	Cleveland Township Empire Township Kasson Township Glen Arbor Township Kasson Township Centerville Twp. Solon Township Empire	Residential Commercial	1200 (summer) 600 (rest of year) 140 (summer) 90 (rest of year)	Glen's Sanitary Landfill
Harland's Disposal	Manistee	(2) 25 cu yd Packer (6) 20 cu yd Packer (1) Load Lugger (2) Roll-off Trucks	Bingham Township Elmwood Township Solon Township	Residential Commercial	Unknown Unknown	Glen's Sanitary Landfill
Ken's Pick-up Service	Traverse City	(2) 25 cu yd Packer (1) 20 cu yd Packer (4) 17 cu yd Packer (2) Roll-off Trucks (1) 20 cu yd Non-compacting Truck	Elmwood Township Solon Township	Residential Commercial	180 35	Glen's Sanitary Landfill
Ron Send Disposal	Suttons Bay	(2) 18 cu yd Packer (2) 17 cu yd Packer	Bingham Township Centerville Township Cleveland Township Elmwood Township Leland Township Suttons Bay Township Suttons Bay	Residential Commercial	1700 (summer) 1300 (rest of year) 100	Glen's Sanitary Landfill
Walt Kalchik Disposal	Northport	(1) 18 cu yd Packer (1) 17 cu yd Packer	Leelanau Township Suttons Bay Township Northport	Residential Commercial	950 (summer) 480 (rest of year) 40 (summer) 35 (rest of year)	Glen's Sanitary Landfill
West Michigan Disposal	Traverse City	(3) 25 cu yd Packer (1) 20 cu yd Packer (2) 17 cu yd Packer	All of Leelanau County	Residential Commercial	850 100	Glen's Sanitary Landfill

SOURCE: Leelanau County Solid Waste Management Plan (1989)
Harland's Disposal data taken from the Manistee County Solid Waste Management Plan (1988)

FIGURE 6-1

Cedar Disposal Service Area

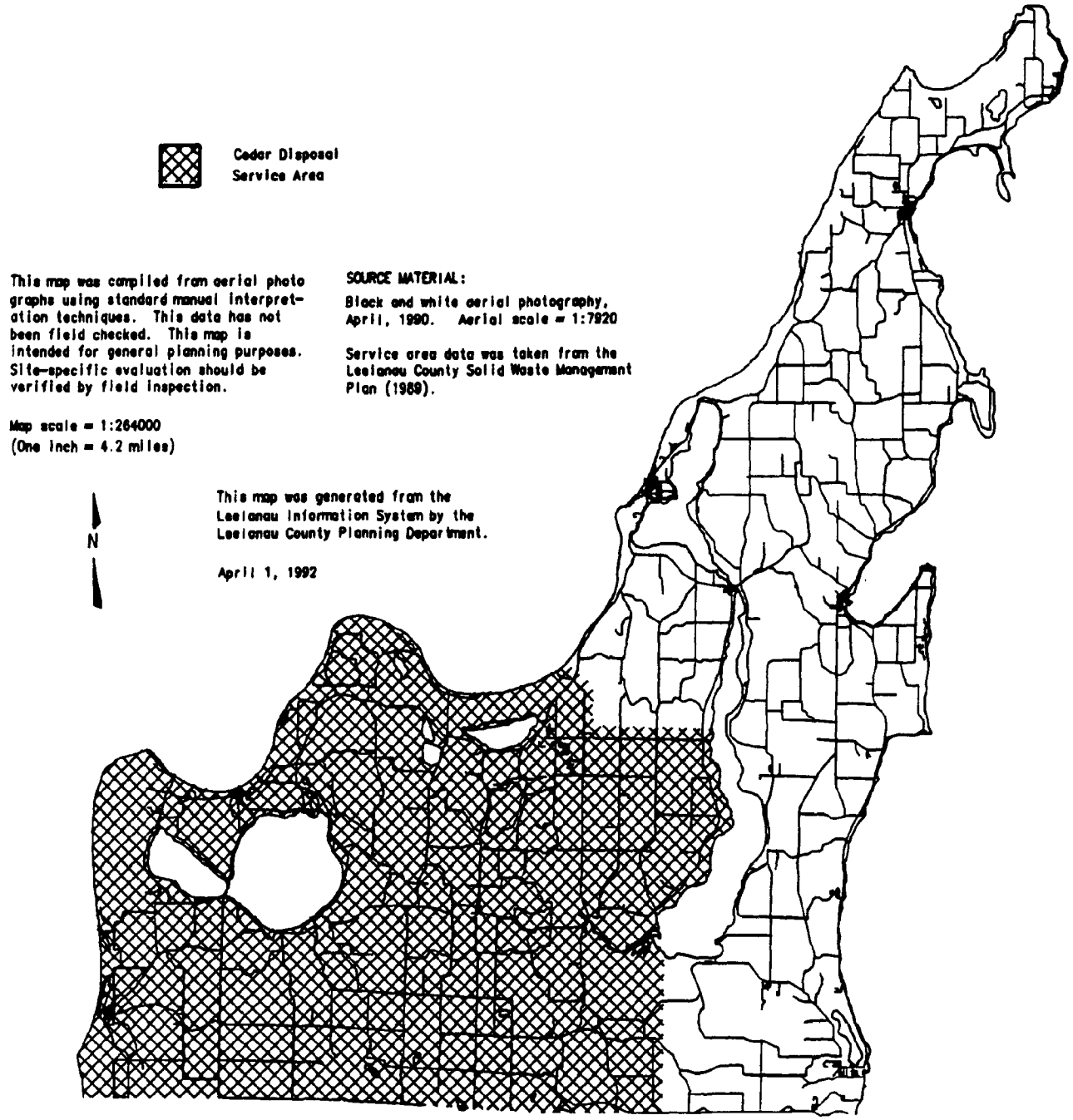


FIGURE 6-2

Harland Disposal Service Area

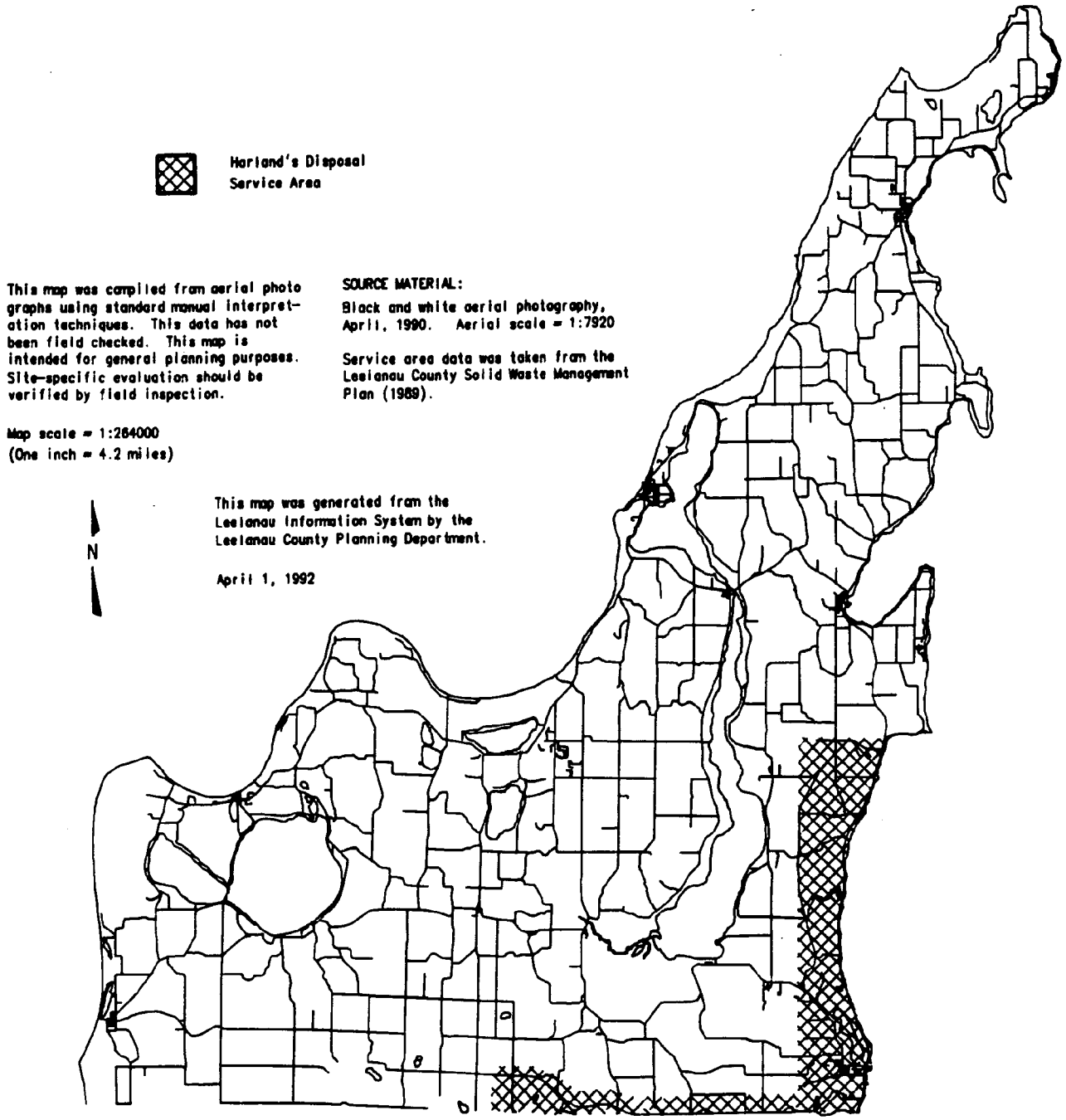


FIGURE 6-3

Walt Kalchik Disposal Service Area

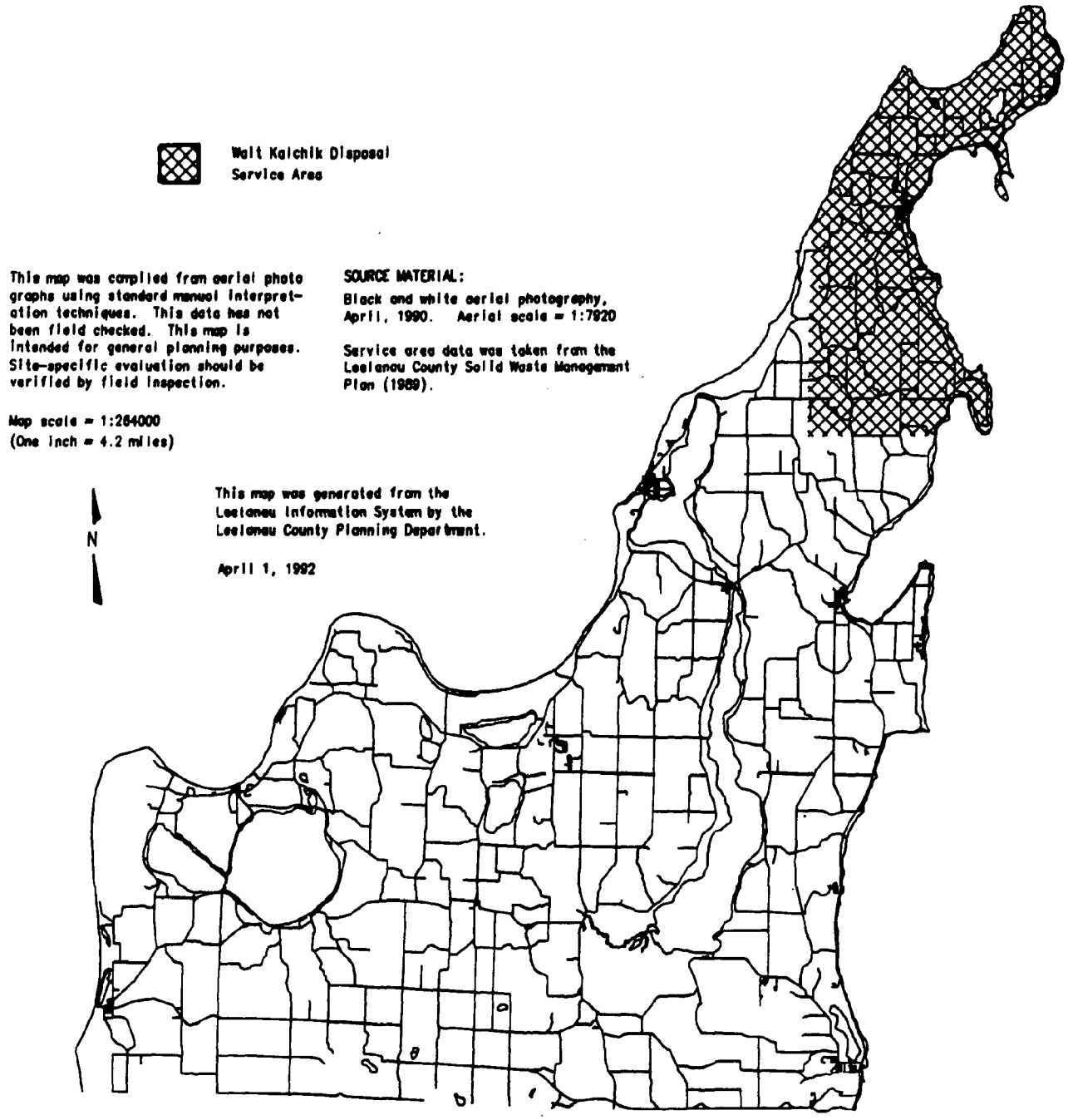


FIGURE 6-4

Ken's Pick-up Service Disposal Service Area

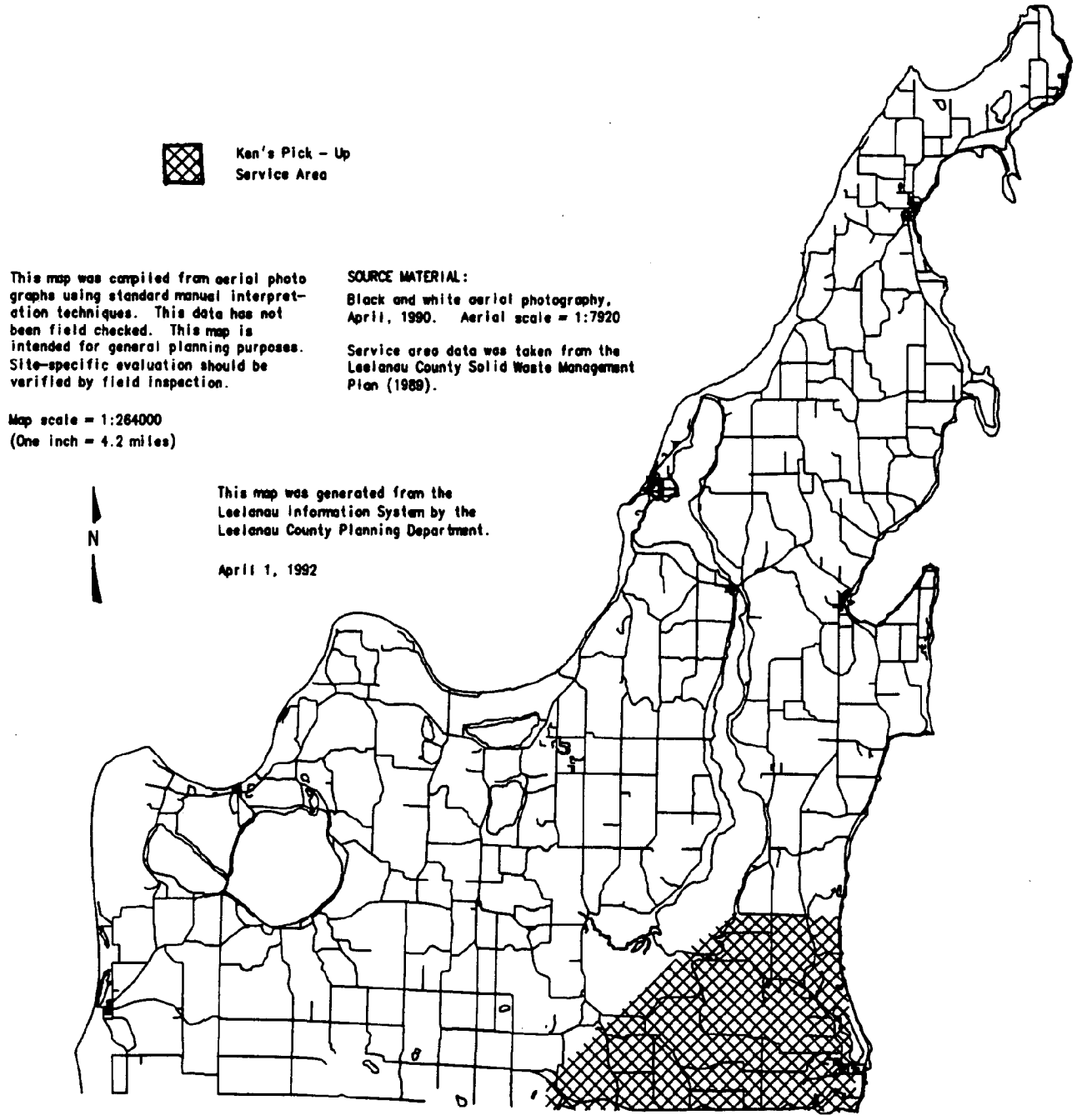


FIGURE 6-5

Ron Send Disposal Service Area

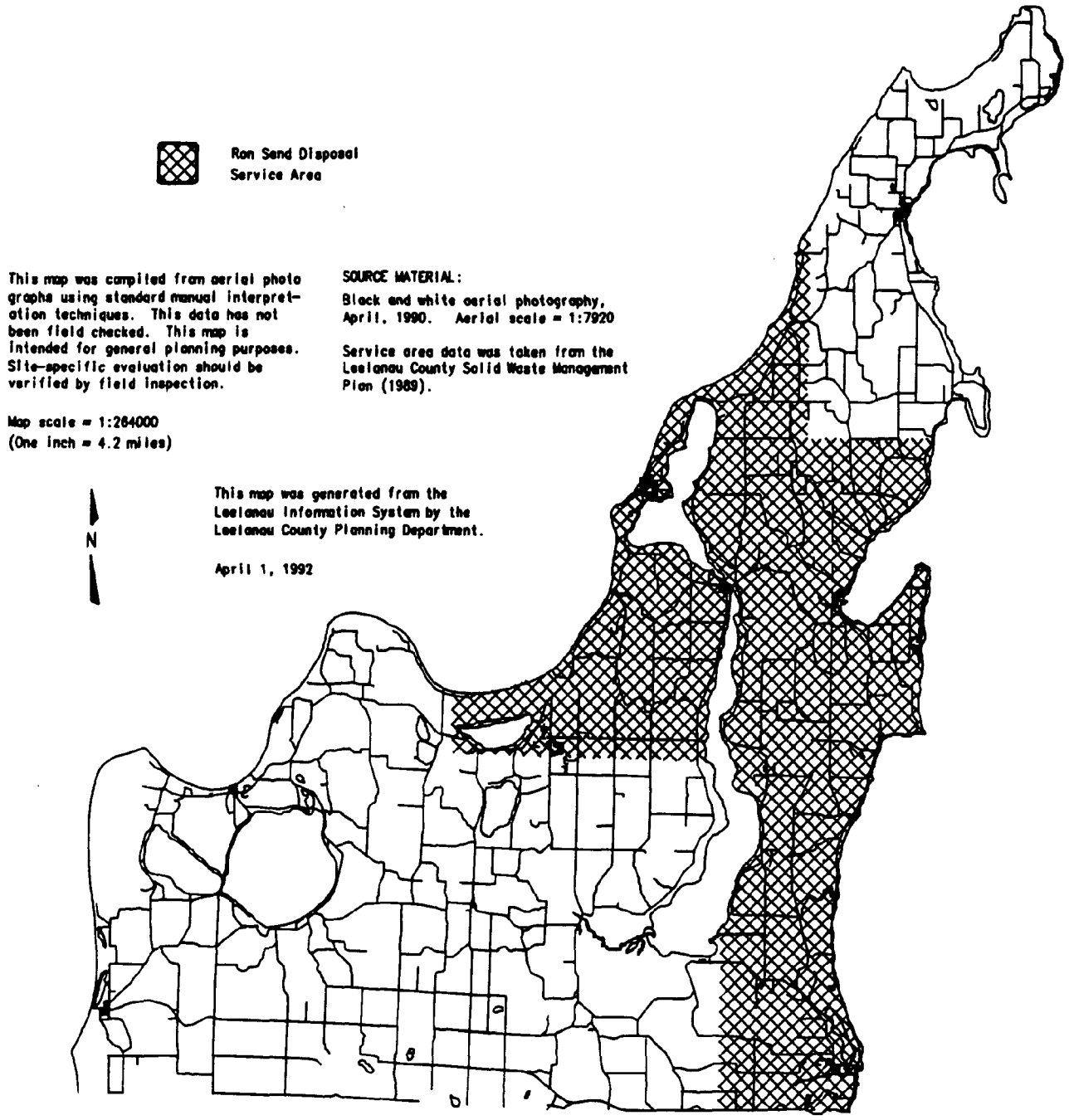
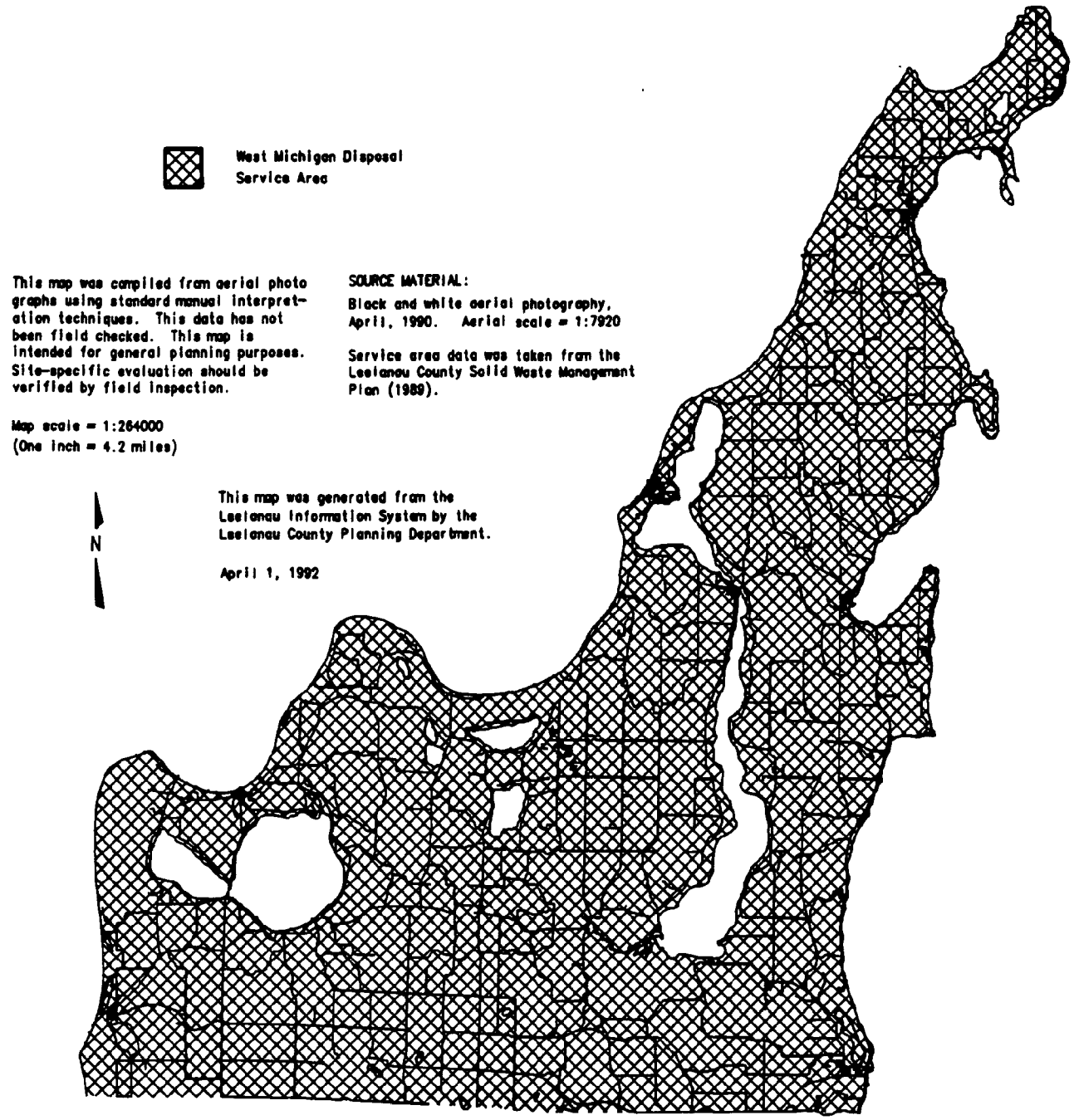


FIGURE 6-6

West Michigan Disposal Service Area



Glen Arbor, Greilickville, Lake Leelanau, and Northport have since been added to the system offering citizens in those areas a convenient alternative to landfilling recyclable materials.

The company involved in setting up the drop-off sites is Grand Traverse Project (GTP) Industries, Inc. GTP's involvement in recycling began in early 1984 with initial research and planning with solid waste management officials. After conducting market studies, GTP developed a comprehensive plan which addressed cost estimates, a management system, operational budgets and marketing plans. After the market study, equipment was purchased, building space acquired, and the facility was staffed. GTP began operating in 1985.

Over the years GTP has grown considerably and now collects newspaper, office paper, cardboard, tin, glass, aluminum, plastic and ferrous metals from sixteen (16) drop-off sites similar to those in Leelanau County. The organization presently employs 18 -20 people and is currently removing over 2600 tons of recyclable materials and 12,000 gallons of used motor oil from the regional waste stream.

The Leelanau County Solid Waste Management Plan, adopted in 1989, calls for the establishment of at least six recycling drop-off sites in the County. Unlike most county plans, the Leelanau Plan does not target a specific collection volume. Noting most citizens are willing to travel no more than five miles to utilize a drop-off site, the Plan calls for strategically locating drop-off facilities in order to allow County citizens maximum opportunity to recycle (see Figure 6-7). This goal is thought to be more realistic than, say, a 25% volume reduction.

The total volume of recyclable material collected at these drop-off sites is significant. In 1991, approximately 34% of the available newsprint was collected, as was about 7% of the available tin, around 20% of the available glass (not including returnable soft drink containers), and roughly 5% of the available office paper. These items represent the "big four" recyclable materials collected at the drop-off sites. Large volumes of corrugated material (cardboard) are also being collected for recycling in Leelanau County. However, since much of this material is being handled by private haulers on a weekly basis, accurate figures are difficult to determine.

With the addition of four drop-off sites in the past two years, the overall volume of material collected in Leelanau County is expected to markedly increase. County citizens are obviously conscious of solid waste stream issues as indicated by the volume of material being collected. In a 1990 scientific, random sample survey of County citizens, 88% of those responding indicated operation of a county-wide recycling system was an action the County should undertake. This further indicates the seriousness with which the citizenry considers the solid waste matters it faces.

THE CURRENT WASTE STREAM

An accurate assessment of the quantity and composition of the solid waste stream is important in solid waste planning. All known solid waste collected in Leelanau and Grand Traverse Counties and a portion of Benzie County is disposed of at Glen's Sanitary Landfill. The quantity of waste collected in Leelanau County can be determined from the

landfill records for the waste haulers serving Leelanau County.

Four of the waste haulers serve Leelanau County only, while five others serve Leelanau plus other counties. For the haulers serving multiple counties, their volume from Leelanau County can be estimated by the proportion of their customers located in Leelanau County. Using the landfill records for a 12-month period from May 1987 through April 1988, the estimated volume collected in Leelanau County by these nine haulers is 36,000 cubic yards. The landfill records indicate that approximately 90% of the landfill tipping fees are collected from commercial haulers. Assuming that the nine haulers bring 90% of the county's waste volume to the landfill, the total estimated annual solid waste volume for Leelanau County is 40,000 cubic yards per year. This is a daily average of approximately 33 tons per day or 2.2 pounds per capita per day based on a seasonally adjusted population of 30,000. The waste volume has increased significantly over the 20.6 tons per day measured in 1982.

The best method to determine the composition of the waste stream is to perform a waste stream assessment. This would consist of taking representative waste samples at the landfill, sorting them into various material categories and weighing them. Waste stream analyses have been performed at a few locations in the state. In 1988, a waste stream assessment was performed at Glen's Sanitary Landfill. It consisted of one week of sampling during each season of winter, spring, summer, and fall. Samples were randomly selected from loads brought to the landfill with the samples being sorted into various categories to be weighed. The waste composition percentages shown in Table 6-3 reflect the findings of the 1988 waste stream analysis.

The waste stream assessment findings have been used to determine the composition of the residential and commercial waste stream only. The industrial waste quantity and composition has been estimated by an independent study. From a Land Use Study performed in 1977 by the Leelanau County Planning Department, 56 industries were identified in the county. During the preparation of the original Solid Waste Plan in 1982, each of these industries were sent a questionnaire along with a cover letter requesting information regarding the amount and type of waste produced by each. A total of 44 interviews took place and from these interviews it was determined that 7 industries produced a significant amount of solid waste. In 1988, all seven of these industries were contacted again to determine if the data from the 1982 industrial waste survey was still accurate. Additional industries that were suspected of possibly producing a significant amount of waste were also contacted. The new survey identified only four industries that produced industrial waste.

Industries producing less than one loose cubic yard or 200 pounds of solid waste per day were considered insignificant industrial waste producers and were not included in the estimate of the industrial waste stream. The industries identified and considered in estimating the industrial waste stream were Prutsman/Tuckmar of Suttons Bay, Cherry Bend Tool and Dye of Cedar, ISG Extrusion Toolings, Inc. of Suttons Bay, and Leelanau Fruit Company of Suttons Bay. Of the original seven industrial waste producers identified in 1982, one was no longer in business while two others were using

TABLE 6-2

Additional Leelanau County Waste Haulers for Wastes Generated in Leelanau County

Hauler	Base of Operation	Equipment	Service Area	Type of Waste	Load Frequency	Disposal Site
Biggs Construction Service, Inc.	Leland	(1) 14 cu yd Dump Truck	Leland Area	Building Materials	One load every two weeks	Glen's Sanitary Landfill
Chess Construction	Elmwood Twp.	(1) 5 cu yd Stake Truck	The Homestead Grand Traverse County	Drywall Scraps	Variable	Glen's Sanitary Landfill
Drywall Dynamics	Elmwood Twp.	(1) 8 cu yd Flatbed Truck	Leelanau County Grand Traverse County	Construction Waste	2 - 3 loads per week	Glen's Sanitary Landfill
Easling Construction, Inc.	Leland	Unknown 10 cu yd Vehicle	Leelanau County	Building Products	Two loads per week	Glen's Sanitary Landfill
Paul Maurer General	Elmwood Twp.	Unknown 10 cu yd Vehicle	Leelanau County	Construction Waste	Variable 0-150 cu yd/month	Glen's Sanitary Landfill
Moquin Construction, Inc.	Elmwood Twp.	(1) 8 cu yd Dump Truck	Leelanau County Grand Traverse County Benzie County	Building Products	Two loads per week	Glen's Sanitary Landfill
Shugart Builders, Inc.	Elmwood Twp.	(1) 12 cu yd Dump Truck	Leelanau County Grand Traverse County	Construction Waste One load per week (7 months)	Two loads per week (5 months)	Glen's Sanitary Landfill

SOURCE: Leelanau County Solid Waste Management Plan (1989)

alternate methods of waste disposal. It was also noted that not all of the solid waste produced by the industries enters the waste stream as some alternate methods of solid waste disposal were being used.

PLANNING AND ADMINISTRATIVE FUNCTIONS

The Leelanau County Solid Waste Management Plan

Michigan's Solid Waste Management Act, Act 641, PA 1978, was enacted by the Michigan Legislature as an act to protect the public health and the environment, to provide for the regulation and management of solid wastes, to prescribe the powers and duties of certain state and local agencies and officials, to prescribe penalties, to make an appropriation, and to repeal certain existing acts.

It is a requirement of Act 641 that each county prepare, or have prepared for them, a Solid Waste Management Plan. The purpose of this planning effort and the Leelanau County Solid Waste Management Plan is to fulfill the requirements of Act 641 for Leelanau County and to provide a planning framework for the solid waste management needs of the County. Leelanau County was one of only three Michigan counties to complete its solid waste plan by the State-mandated deadline of January 6, 1989. The plan received unanimous support of all townships and villages of the County and has served as the County's policy guideline in implementing solid waste management programs.

The plan was formulated to meet the following goals and objectives, based on current research defining the volumes and type of solid waste generated in Leelanau County.

1. Select an ecologically sound, economically feasible twenty-year plan for solid waste management in Leelanau County.

2. Ensure that the solid waste management plan does no harm to Leelanau County's environmental quality and quality of life.

3. Select a solid waste management system that safeguards the health and well-being of Leelanau County citizens in perpetuity.

4. Develop sustainable methods of solid waste handling such as recycling, composting, and others. Provide for timely implementation of such measures.

5. Insure a viable solid waste collection system to serve Leelanau County citizens.

6. Clarify the responsibilities of the private sector and the County Government or public authority for solid waste collection and management.

7. Provide the means and encouragement for public involvement in solid waste management decisions.

8. Mandate the responsibility of the County Government or public authority in ongoing solid waste management decision making and planning.

Several alternative solid waste management systems were evaluated in the planning process. Each alternative was evaluated and ranked in terms of the following criteria:

- Technical Feasibility
- Economic Feasibility
- Site Availability
- Transportation Network
- Energy Conservation
- Environmental and Public Health
- Public Acceptance.

Solid Waste Collection

Over the 5-year period of the short-term plan, traditional solid waste collection will be handled by the private sector. Pick up and transportation services for solid waste and recyclables will be furnished by private companies providing this service. The county government will encourage the private sector to continue to provide this service.

Recycling

Leelanau County's recycling system for the five-year period will consist of drop-off sites for the collection of recyclable items. Participation will be on a voluntary basis. A collection system may be implemented within the time span.

At a minimum, each drop-off site will consist of a trailer containing separate containers for the following items:

Newsprint	Glass
Cardboard	Ferrous Metals
Office Paper	Aluminum
Brown Paper	Waste Oil

Approximately 40% (13 tons per day) of the existing waste stream consists of these materials (see Table 6-3). Additional materials may be collected in the future as technology for recycling improves and markets are developed. Figure 6-7 shows the location of all seven recycling drop-off sites in Leelanau County.

Composting

During the five-year Plan period, Leelanau County will encourage composting in the following ways:

(1) Support legislation that encourages composting, such as the banning of yard wastes from landfills.

(2) Provide promotional and educational materials concerning composting to the public. Such materials would include recommendations for individual backyard composting of organics.

The SWaMB will also develop a Composting Plan for the County. Such a Plan will be necessary in order to allow the County municipalities and citizenry to comply with recent State legislation banning yard wastes from landfills (Act 264, P.A. 1990). This legislation prohibits the disposal in landfills or incinerators of yard clippings generated or collected from land owned by county, local or state agencies beginning in 1993. Beginning in 1995, disposal of yard clippings from any source into landfills or incinerators will be prohibited.

Disposal

All waste materials that are not removed from the waste stream by source reduction, recycling, or composting, will be disposed of by landfilling. Glen's Sanitary Landfill will be the primary disposal site for Leelanau County for the five-year planning period.

Household Hazardous Waste Collection

Household hazardous waste collection in Leelanau County will consist of at least one collection day per year in the short term.

TABLE 6-3

1987 Leelanau County Residential, Commercial, and Industrial Waste Stream

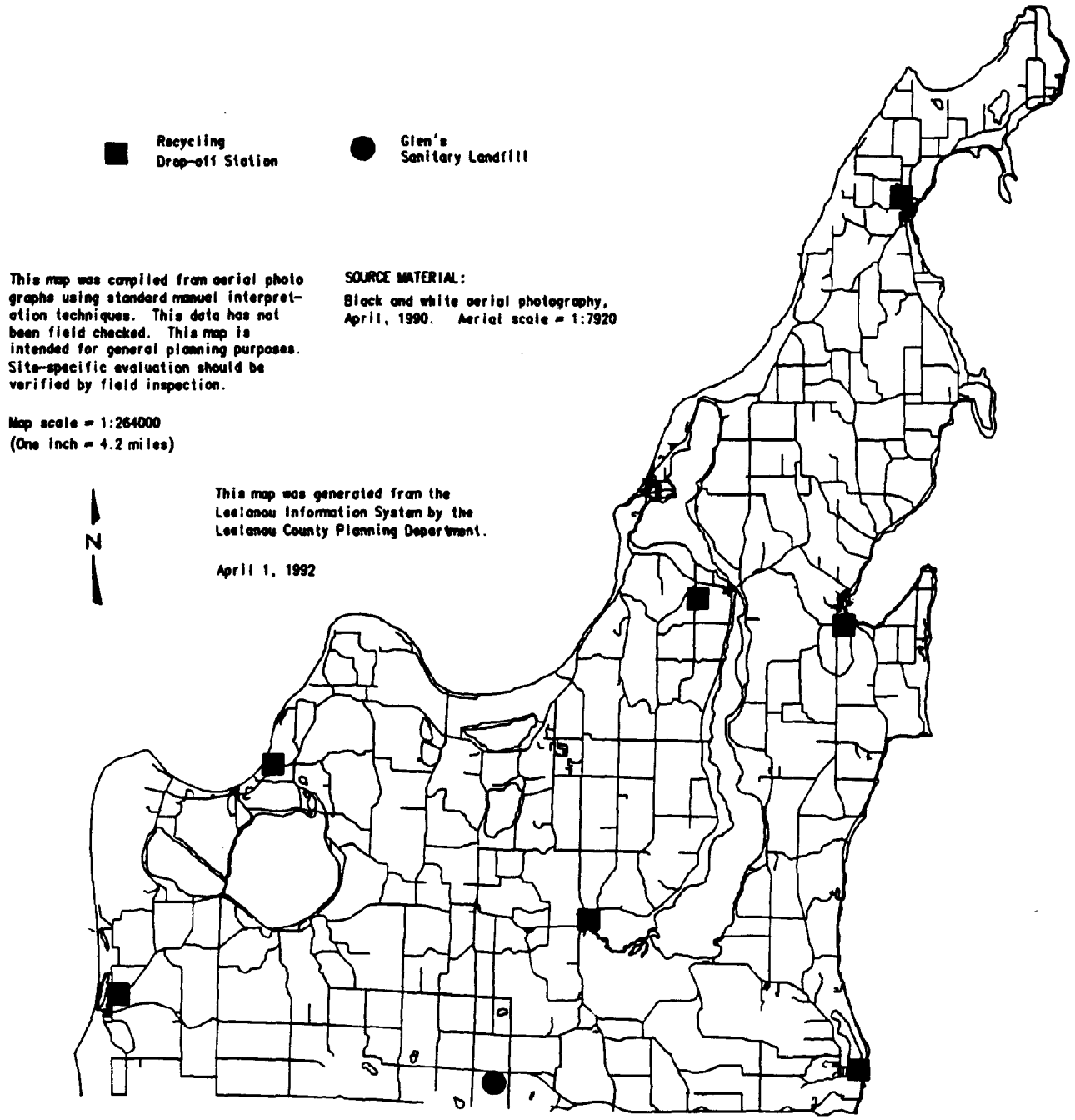
Constituent	INDUSTRIAL WASTE			RESIDENTIAL AND COMMERCIAL WASTE			TOTAL		
	Total Produced (lb./day)	Percent of Total Industrial	Unit Rate (lb./capita per day)	Total Produced (lb./day)	Percent Commercial	Unit Rate (lb./capita per day)	Total Produced (lb./day)	Percent of Total	Unit Rate (lb./capita per day)
ORGANICS									
Newsprint	1	0.0%	0.00	4,339	6.9%	0.14	4,340	6.6%	0.14
Office Paper	50	1.7%	0.00	1,300	2.1%	0.04	1,350	2.0%	0.04
Corrugated	250	8.4%	0.01	12,338	19.6%	0.41	12,588	19.1%	0.42
Yard Waste	0	0.0%	0.00	1,450	2.3%	0.05	1,450	2.2%	0.05
Textiles	0	0.0%	0.00	1,138	1.8%	0.04	1,138	1.7%	0.04
Plastic	0	0.0%	0.00	6,308	10.0%	0.21	6,308	9.6%	0.21
Magazines	0	0.0%	0.00	3,220	5.1%	0.11	3,220	4.9%	0.11
Food Waste	440	14.8%	0.01	7,102	11.3%	0.24	7,542	11.4%	0.25
Wood	75	2.5%	0.00	3,843	6.1%	0.13	3,918	5.9%	0.13
Fines	0	0.0%	0.00	2,248	3.6%	0.07	2,248	3.4%	0.07
Other Organics	40	1.3%	0.00	12,860	20.4%	0.43	12,900	19.5%	0.43
INORGANICS									
Glass	15	0.5%	0.00	2,450	4.0%	0.08	2,555	3.9%	0.09
Ferrous	2100	70.7%	0.07	3,113	4.9%	0.10	5,213	7.9%	0.17
Non-ferrous	0	0.0%	0.00	616	1.0%	0.02	616	0.9%	0.02
Other Inorganics	0	0.0%	0.00	600	1.0%	0.02	600	0.9%	0.02
TOTALS	2971	100%	0.10	63,029	100%	2.10	66,000	100%	2.20
	1.5 Tons per Day			31.5 Tons per Day			33.0 Tons per Day		

NOTES:
1. Industrial waste quantities based on 1980 and 1988 Industrial Waste Surveys by Gosling-Czubak Associates.
2. Total waste stream quantity based on waste volumes received at Glen's Sanitary Landfill between May, 1987 and April, 1988 from haulers serving Leelanau County.
3. Constituent percentages based on 1988 waste stream assessment at Glen's Sanitary Landfill.
4. Unit waste generation rates based on seasonally adjusted population of 30,000.

SOURCE: Leelanau County Solid Waste Management Plan (1989)

FIGURE 6-7

Solid Waste Management Facilities in Leelanau County



Additional collection days may be added depending on demand and funding.

The collection days will be promoted as "waste exchange days" in which the public will be allowed to claim paints and other materials that others wish to dispose of. This will decrease the volume of hazardous waste needing disposal while providing individuals with free materials.

Other hazardous wastes consisting of agricultural chemicals and other wastes stored in large quantities will be handled separately from the household hazardous wastes. The Plan calls on the Solid Waste Management Board to develop a program and locate a funding source for the collection and proper disposal of these wastes. The Cooperative Extension Service has successfully pursued grant funds to finance the program in the past, and will be encouraged to continue this activity in the future.

Further Solid Waste Management Activity

The SWaMB will work in conjunction with the Soil Conservation Service, the Cooperative Extension Service, and any other agencies having responsibility in the solid waste management arena to carry-out the following tasks:

a. Encourage the development by private enterprise of one or more Type III landfills in Leelanau County.

b. Favor development of transfer stations to effectively handle solid waste, if needed.

c. Any hazardous wastes produced in Leelanau County will be sent to a licensed hazardous waste disposal site. The County does not intend to establish such a site.

d. The County SWaMB will be charged with the responsibility for continued funding of an on-going public information and education campaign designed to keep the local residents and taxpayers informed as to the status of solid waste efforts.

e. Participate in establishing a Regional Solid Waste Commission with other counties in Northwestern Lower Michigan. This Commission would be responsible for regional solutions to solid waste problems.

f. Address details of expanded recycling efforts such as organized collection and ordinances mandating participation.

Administrative Functions

The management responsibilities associated with the County's solid waste management program are divided among various agencies.

Department of Natural Resources

Various sections of the Department of Natural Resources (DNR) are charged by law with the regulation, enforcement and review of the conduct of solid waste management systems in Leelanau County and all other Michigan counties. The County will be dependent upon the appropriate offices of the DNR to be informed of changes in the requirements for solid waste management from both the federal and state levels. This information from the DNR will include new solid waste legislation, regulatory rulings, changes in the handling or disposal of all types of solid waste, national or state public

information programs, financial aid programs from the national or state level available to the county, and technical assistance from DNR staff.

Leelanau County Board of Commissioners

The County Board is responsible for the overall supervision of the solid waste management system for the County. This responsibility includes the implementation of the Leelanau County Solid Waste Management Plan. It also includes financing, administration and operations of the county solid waste management system, as well as accountability to the public. The County Board has created a Solid Waste Management Board (SWaMB) responsible for implementing the Solid Waste Management Plan. The County Board will be responsible for funding a portion of the recycling and household hazardous waste collection programs.

Solid Waste Management Planning Advisory Committee (SWaMPAC)

The Leelanau County Solid Waste Management Planning Advisory Committee is responsible for the preparation and submission of the state-mandated solid waste management plan. The SWaMPAC is also responsible for assisting in the plan approval process. Every five years, the SWaMPAC will update the solid waste management plan for the County. The SWaMPAC will begin work on the 5-year updates at least two years prior to the state-set deadline for submission of the revised plan. The 14-member committee, appointed by the Board of Commissioners, is staffed by the Planning Department.

Solid Waste Management Board (SWaMB)

The County Board has created a Solid Waste Management Board that is responsible for implementation of the Solid Waste Management Plan. The SWaMB consists of five members appointed to three-year terms by the Board of Commissioners. The purpose and functions of the SWaMB are:

1. To assist in the implementation of the Leelanau County Solid Waste Management Plan.

2. To provide advice and consultation to the Leelanau County Planning Department, the Leelanau County Planning Commission, and the Leelanau County Board of Commissioners and their staffs.

3. Review and comment on the County's work program for solid waste activities specified in Act 641.

4. Identify local priorities for solid waste management.

5. Insure that coordinated public participation is a part of the solid waste management process.

6. Provide a public forum for discussion of issues relevant to the solid waste management process; to act as a communications linkage to municipalities and the public in Leelanau County; and to provide information to public interest groups.

7. Act in conjunction with similar planning efforts in neighboring counties and to provide coordination with other county solid waste management programs.

County Planning Department

The County Planning Department is responsible for the continued planning effort in the solid waste management field for the County. This planning is done in coordination with the Northwest Michigan Council of Governments, the Leelanau County Solid Waste Management Planning Advisory Committee, the Solid Waste Management Board, and other units of government which are actively involved in solid waste management planning and implementation of plans. The County Planning Department is the "central clearing house" of all solid waste management planning information as it relates to Leelanau County. The Planning Department acts as staff to the Solid Waste Management Board and state-mandated Solid Waste Management Planning Advisory Committee.

Township and Village Governments

The local units of government in the County advise the Solid Waste Management Board as to the effectiveness of the County Solid Waste Management Plan and will inform the Board of solid waste issues, problems, and opportunities. The Board is able to keep the local units of government informed as to solid waste management activities so that the townships and villages may keep citizens totally informed of solid waste management programs. Townships and villages are periodically asked to enter into intergovernmental agreements for solid waste management activities. An example of this is the Interlocal Agreements that exist between the County and all townships and villages for financial administration of the solid waste management programs.

PROGRAM FUNDING

A non-profit, volunteer organization known as *Recycle Leelanau* did an excellent job of making sure recycling in Leelanau County became a reality. Unfortunately, the supply of volunteers to staff the drop-off sites on a continual basis was limited and, as additional drop-off sites were added, the volunteer resource was stretched beyond its limit. For that reason, the Leelanau County Solid Waste Management Board (SWaMB) has began considering paid staffing options.

In 1988, the Michigan Legislature examined the issue of funding for local resource recovery, recycling, composting, household hazardous waste collection and education programs. The result of this legislative effort was Act 138, P.A. 1989, which allows counties to impose an annual household surcharge of up to $25 to fund local solid waste management efforts. The surcharge is subject to inter-local agreements between the County and its municipalities. The SWaMB, in need of a funding source to assure the continuity of the County solid waste management program, settled on the provisions of Act 138 as being the most practical. The recommended program budget equates to an annual surcharge of approximately $8.00 per County household. All municipalities agreed to the surcharge concept in 1991, resulting in the current solid waste management program.

This minimal surcharge will also assure an ongoing household hazardous waste collection program. As many citizens have learned of late, disposal of such items as paint, thinners, drain cleaners, and other petroleum and chemical based products has become quite difficult. Some agricultural

products have also fallen into the "hazardous" category, causing the necessary stockpiling of dangerous compounds. Hopefully, by making use of the provisions of Act 138, proper disposal of these items will be made easier for the general public.

INTER-COUNTY TRANSPORTATION OF SOLID WASTE

One of the most controversial components of Act 641 deals with inter-county transportation of solid waste. Because Leelanau County is a "waste receiving" county, issues involving disposal of incoming material can be acute. Act 641 administrative rules require that a solid waste disposal site located in one county and serving another must be identified in the solid waste plans of both counties. The interpretation of this rule is that if a county wants to use an existing disposal site or locate a new one in another county, it must request its inclusion in that county's solid waste plan. If the county in which the site is located refuses to accept the other county's wastes, the other county must find another site.

Any county that lists Glen's Sanitary Landfill or any other site in Leelanau County in its Solid Waste Management Plan as a primary or contingency site must have a program for diverting a portion of the wastes from the landfill. The waste diversion program must be acceptable to Leelanau County and shall contain, as a minimum, the following items:

(1) Public education program.

This program must inform the public as to proper disposal methods for various wastes so that no improper wastes are disposed of in the landfill. The educational program must also inform the public as to the importance of recycling and how the public can participate.

(2) Recycling Program

The County's recycling program must include a sufficient number of drop-off sites to provide the public with an opportunity to participate in the program.

(3) Composting Program

The County must establish or participate in a composting program to prevent yard wastes and other organic wastes from being disposed of in the landfill.

(4) Household Hazardous Waste Collection

The County must conduct or participate in at least one household hazardous waste collection day per year. The collected wastes shall be disposed of at a facility licensed to receive that type of waste.

Counties using a site in Leelanau County as a primary disposal facility must implement a waste diversion program as described above. All counties designating primary or contingency sites in Leelanau County must have a reciprocal agreement with Leelanau County.

Glen's Sanitary Landfill is presently the primary disposal site for solid waste generated in Leelanau, Grand Traverse and Benzie Counties. The landfill serves as a contingency disposal site for Emmet, Charlevoix, Antrim, Kalkaska, Manistee and Missaukee Counties. Figure 6-8 shows the

counties listing Glen's Sanitary Landfill in their plans.

ITEMS FOR DISCUSSION

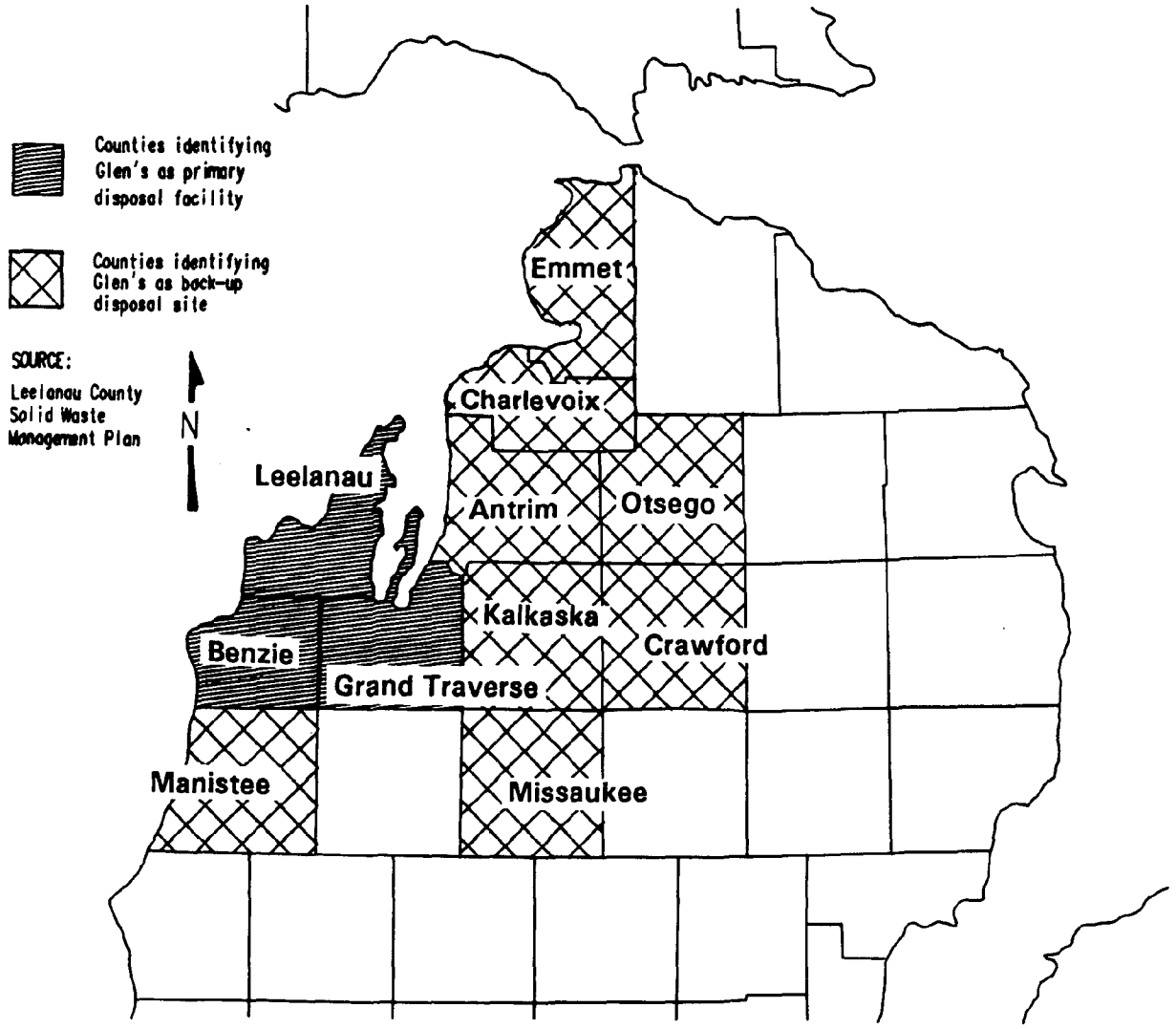
Landfills have gradually diminished in numbers in recent years. New landfills are very difficult to site due primarily to their perceived impact on property values, local water quality, and general unsightliness. It is also recognized that Glen's Sanitary Landfill in Leelanau County will, some day, cease operation. This fact became all too clear in early 1992 when DNR officials indicated the landfill may not be relicensed unless certain clean-up measures were initiated by the landfill's owner. Officials were left wondering if a back-up plan would need to be activated. Fortunately, the Landfill owners and the DNR were able to settle their differences and the flow of solid waste was not interrupted. However, all landfill licenses are valid for only two years. Leelanau County could face a similar situation at that time - and every two years thereafter.

The economics of landfilling in northwestern lower Michigan dictate regional usership in order to sustain financial stability from a business standpoint. Currently Leelanau, Benzie, and Grand Traverse Counties are the primary users of Glen's Sanitary Landfill. In compliance with Act 641, each of these Counties independently maintains a solid waste management plan. As a result, each County also independently maintains a solid waste management program. Without considering a regional approach to solid waste management issues, it has been argued that the best program will be doomed to failure. The loss of waste flow from any one of these Counties would surely have a devastating impact on the economic viability of Glen's Sanitary Landfill. In the case of Leelanau County, closure of Glen's would mean at least a doubling of monthly trash pick-up costs due mostly to the increased hauling distance to either Manistee or Charlevoix County. Equally important, a single County's recycling program will have only minimal impact on the waste stream if the other Counties continue to rely on landfilling as their only means of solid waste disposal.

As landfill alternatives such as recycling, composting and household hazardous waste collection programs become commonplace, steady funding sources will have to be found. Many feel mandatory recycling programs will be implemented in the future. Composting will become more prevalent after 1995 when all yard wastes will be banned from landfills in Michigan. County, township and municipal governments will again be called upon to fund these programs.

FIGURE 6-8

Primary and Contingency Users of Leelanau County Solid Waste Management Facilities



APPENDIX A

Elmwood Twp Fire Dept

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: Elmwood Twp Fire Dept. **TX NUMBER** (616) 941-1647
COUNTY: Leelanau **CHIEF** Lee Johnson

ENGINES:	MANUFACTURER	YEAR	PUMP CAPACITY	TANK H_2O CAPACITY
1:	Ford C800	84	750 GPM	500 gals
2:	Ford C900	70	750 GPM	700 gals
3:				
4:	Ford F259 4x4	74	250 GPM	200 gals

WATER TENDERS:	MANUFACTURER	YEAR	TANK H_2O CAPACITY	DROP TANK CAP
1:	Louisvill L900	78	Discharge 1½ minute	2,000
2:				
3:				
4:				

HOSE:	NUMBER OF LENGTHS	THREAD
1"	12	
1 1/2"	24	
2"		
2 1/2"	34	
3"		

LIST ANY OTHER HOSE BELOW
200' 5" stortz hose

HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST: 1- Deluxe gun - portable

FOAM EQUIPMENT: TYPE	AMOUNT	EDUCTORS: CAPACITY	NUMBER
AFF foam	40 gal		2
High expansion	15 gal		
Light water	25 gal		

SCBA'S: TYPE	NUMBER	TANK CAPACITY	EXTRA TANKS
Scott's	10	30 minute	6
Cascade Trailer		Able to fill another 16	16 pre-filled

PORTABLE PUMPS: MANUFACTURER	TYPE	NUMBER	CAPACITY
Kubota		1	500 GPM
Midland		1	350 GPM

GROUND LADDERS: LENGTH	TYPE	NUMBER
24'	extension	1
12'	root	2
30'	extension	1

SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
1- K-12, 3- portable generators, 1-set porta power, 1- Homelite chain saw, 1- smoke ejector, 1- set Jaws with power ram, 6- portable quartz floodlights, 1- complete set of air bags, and 2- resusciators.

COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
Batallion 11 Garfield Twp, Grand Traverse County, Batallion 10, Long Lake Twp, Grand Traverse County, Suttons Bay-Bingham, Leelanau County, Cedar, Leelanau County.
(Most frequently called upon departments)

No Ambulance
Contracts with Grand Traverse Emergency Medical Service
to Trans port.

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: EMPIRE TX NUMBER 326 5849
COUNTY: LEE (AUSTIN) CHIEF PHIL DOERING
ENGINES: MANUFACTURER - YEAR - PUMP CAPACITY - TANK H_2O CAPACITY
1: GMC - 85 - 1000 - 1000
2: ____ - ____ - ____ - ____
3: ____ - ____ - ____ - ____
4: CHEV 4x4 - 80 - 500 - 500
WATER TENDERS: MANUFACTURER - YEAR - TANK H_2O CAPACITY - DROP TANK CAP
1: CHEV - 80 - 1500 - 1500 - 2000
2: ____ - ____ - ____ - ____
3: ____ - ____ - ____ - ____
4: ____ - ____ - ____ - ____
HOSE: NUMBER OF LENGTHS - THREAD
1" 300 - ____
1 1/2" 1500 - ____
2" ____ - ____
2 1/2" 2500 - ____
3" ____ - ____
LIST ANY OTHER HOSE BELOW
HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST: ____
FOAM EQUIPMENT: TYPE - AMOUNT
AFFF - 25
EDUCTORS: CAPACITY - NUMBER
150 GPM - 1
SCBA'S: TYPE - NUMBER - TANK CAPACITY - EXTRA TANKS
SCOTT - 10 - ____ - 10
PORTABLE PUMPS: MANUFACTURER - TYPE - NUMBER - CAPACITY
BRIGGS - VOL - 1 - 300
HOMELITE - VOL - 1 - 300
GROUND LADDERS: LENGTH - TYPE - NUMBER
35 - EXT - 1
24 - EXT - 1
14 - ATTIC - 1
SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
2 SMOKE EJECTORS
2 GENERATORS
1 SAW
COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
ALL LEE (AUSTIN) COUNTY MUTUAL AID
BONZIC COUNTY MUTUAL AID
N.P.S. MUTUAL AID.

STATION 3 GLEN ARBOR FIRE/RESCUE DEPT

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: GLEN ARBOR TX NUMBER 334-411
COUNTY: LEELANAU CHIEF LEO R BUCKLEE

ENGINES:	MANUFACTURER	YEAR	PUMP CAPACITY	TANK H_2O CAPACITY
1:	FMC	88	1250	1000
2:	PIERCE	78	450	250
3:	CHEV TANKER	86	250	1500
4:				

WATER TENDERS:	MANUFACTURER	YEAR	TANK H_2O CAPACITY	DROP TANK CAP
1:	CHEV	86	1500	1000
2:	FORD	76	1600	1000
3:				
4:				

HOSE:	NUMBER OF LENGTHS	THREAD
1"	12	NST
1 1/2"	20	NST
2"		
2 1/2"	28	NST
3"		

LIST ANY OTHER HOSE BELOW

HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST: 2 AKRON MONITORS, 1 ATTK. NOZZLE

FOAM EQUIPMENT:	TYPE	AMOUNT	EDUCTORS: CAPACITY	NUMBER
	3% AFFF	15 GALS	1000 GPM	1

SCBA'S:	TYPE	NUMBER	TANK CAPACITY	EXTRA TANKS
	Scott	7	30 MIN	10

PORTABLE PUMPS:	MANUFACTURER	TYPE	NUMBER	CAPACITY
PORTABLE	HYDRANT	PORT.	1	750 GPM
	B+S	"	1	400 "
	B+S	"	1	250 "

GROUND LADDERS:	LENGTH	TYPE	NUMBER
	35'	ALUM	1
	24'	"	1
	14'	"	1

SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
FIRE CHIEF, 3 LIGHT GENERATORS 6 1500 W LIGHTS 2 SAWS 2 SMOKE EJECTORS, 1-4 TON DERMA POWER, 8 HYDRANT PUMP CANS, SNOWMOBILE SLED,

COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
LEELANAU COUNTY F. DEPTS.
NATIONAL PARK SERVICE

1 Ambulance - 1988

STATION 4

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: Leland Twp Lake Leelanau TX NUMBER 256 9611
COUNTY: Leelanau CHIEF James Fluke
ENGINES: MANUFACTURER YEAR PUMP CAPACITY TANK H_2O CAPACITY
1: Barton Amorm - 1952 - 500 - 800 GAL
2: 4 Guys Tanker - 1986 - 2100 450 PSI - 2100 GAL
3: GMC - 1953 - - 800 GAL
4: Brush 29 - 1951 - Portable Pump - 275
WATER TENDERS: MANUFACTURER YEAR TANK H_2O CAPACITY DROP TANK CAP
1: Ford - NFT - - 1500 GAL DROP TANK
2: - - - 2500 GAL " "
3: - - - -
4: - - - -
HOSE: NUMBER OF LENGTHS THREAD
1" 300' - NFT.
1 1/2" 450' - "
2" - "
2 1/2" 1250' - "
3" - -
LIST ANY OTHER HOSE BELOW
50' 5"
HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST:
FOAM EQUIPMENT: TYPE AMOUNT EDUCTORS: CAPACITY NUMBER
A-F-F-F 15 gal 125 GPM - 1
SCBA'S: TYPE NUMBER TANK CAPACITY EXTRA TANKS
Scott Air Pacs - 6 - 2267 - 5
PORTABLE PUMPS: MANUFACTURER TYPE NUMBER CAPACITY
Gorman Rupp - - 1 - 250 GPM
Hale - 3XD - 2 - " "
GROUND LADDERS: LENGTH TYPE NUMBER
35' - Wood - 1
24 - Aluminum - 1
SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
Homelite K-12 14" 1 Smoke Ejector.
Echo Chainsaw CS400 5 500W Quartz Lites
Onan Light Plant.
Army Surplus Light Plant
COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
North Port: Elmwood
Leland Glen Arbor
Suttons Bay Empire
Cedar Lake Leelanau

STATION 3 LELAND [illegible]

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: Leland Vol. Fire Dept TX NUMBER 256-9311

COUNTY: Leelanau CHIEF Charles Stander

ENGINES:

	MANUFACTURER	YEAR	PUMP CAPACITY	TANK H_2O CAPACITY
1:	American	76	750	650
2:				
3:				
4:				

WATER TENDERS:

	MANUFACTURER	YEAR	TANK H_2O CAPACITY	DROP TANK CAP
1:	4 Guys	87	2100	2500
2:				
3:				
4:				

HOSE:

	NUMBER OF LENGTHS	THREAD
1"	400	
1 1/2"	700	
2"		
2 1/2"	1200	
3"	500	

LIST ANY OTHER HOSE BELOW

100' 5"

HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS

LIST:

FOAM EQUIPMENT:

TYPE	AMOUNT	EDUCTORS: CAPACITY	NUMBER
6%	15 gal		1

SCBA'S:

TYPE	NUMBER	TANK CAPACITY	EXTRA TANKS
Scotts	6	30	8

PORTABLE PUMPS:

MANUFACTURER	TYPE	NUMBER	CAPACITY
Port. Hydrant		1	750
		2	250

GROUND LADDERS:

LENGTH	TYPE	NUMBER
35'	EXT.	1
24'	EXT.	1
14'	ATT.	1

SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.

1 Gen. – Porta Power – Saws – Smoke Ejector –

COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.

All Leelanau Co. Depts.

STATION 6 NORTHPORT FIRE DEPT.
NORTHPORT Ambulance

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: LEELANAU TWP. TX NUMBER 256-9121 386-5343
COUNTY: LEELANAU CHIEF RALPH EARL
ENGINES: MANUFACTURER YEAR PUMP CAPACITY TANK H_2O CAPACITY
1: GMC - 73 - 650 - 750
2: GMC - 50 - 500 - 500
3: FORD - 76 - 150 - 250
4: - - -

WATER TENDERS: MANUFACTURER YEAR TANK H_2O CAPACITY DROP TANK CAP
1: FORD - 85 - 1800 - 1-1200 2-1500
2: - - -
3: - - -
4: - - -

HOSE: NUMBER OF LENGTHS THREAD
1" - LIST ANY OTHER HOSE BELOW
1 1/2" 600 FT. -
2" -
2 1/2" 1500 FT -
3" -

HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST: DELUGE GUN

FOAM EQUIPMENT: TYPE AMOUNT EDUCTORS: CAPACITY NUMBER
3/6 LIGHT H2O 20 GALS - 2

SCBA'S: TYPE NUMBER TANK CAPACITY EXTRA TANKS
SCOTT - 9 - - 5

PORTABLE PUMPS: MANUFACTURER TYPE NUMBER CAPACITY
HOMELITE - - - 150
HOMELITE - - - 150
HOMELITE - - - 150

GROUND LADDERS: LENGTH TYPE NUMBER
28' - 2
14' - ROOF - 1
40' - 1

SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
2- SMOKE EJECTORS 1- GENERATOR 1- K20 SAW
1- SET OF 3 AIR BAGS 3- PORTABLE LIGHTS

COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
LEELANAU COUNTY.
GRAND TRAVERSE METRO

1 - FORD Ambulance 1984

Dec 1991 DC

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: CEDAR FIRE DEPT TX NUMBER 228-5989
COUNTY: LEELANAU CHIEF ALBIN J. ROSINSKI

ENGINES:	MANUFACTURER	YEAR	PUMP CAPACITY	TANK H_2O CAPACITY
FORD 1:	AMERICAN	69	500	750
GMC 2:	E-ONE	78	400	300
3:				
4:				

WATER TENDERS:	MANUFACTURER	YEAR	TANK H_2O CAPACITY	DROP TANK CAP
1:	FORD	79	1400	2000
2:	CHEV	69	1000	1000
4-WD 3:	DODGE	85	300	—
AMB 4:	FORD	83		

HOSE:

NUMBER OF LENGTHS	THREAD
1"	
1 1/2" 1500 FT	NST
2"	
2 1/2" 3000 FT	NST
3"	

LIST ANY OTHER HOSE BELOW

HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST: 750 GPM DECUCE

FOAM EQUIPMENT: TYPE	AMOUNT	EDUCTORS: CAPACITY	NUMBER
HIGH EXP	10 GAL		1
3%	25 GAL	95 GPM	1

SCBA'S: TYPE	NUMBER	TANK CAPACITY	EXTRA TANKS
SCOTT	6	2300 LB	6

PORTABLE PUMPS: MANUFACTURER	TYPE	NUMBER	CAPACITY
AMERICAN	VOL	2	300 GPM
HOMELITE	VOL	1	400 GPM
RUPP	VOL	1	1000 GPM

GROUND LADDERS: LENGTH	TYPE	NUMBER
35	EXT	1
24	EXT	1
20	EXT	2

SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
K-12 - GENERATOR 115 VOLT - GENERATOR 220 VOLT
PORTA POWER 10 TON - PORTA POWER 4 TON - CHAINSAWS 2
SMOKE EJECTOR 1 - PROXIMITY SUITS 2 - PORTABLE LIGHTS - 6
JAWS OF LIFE - AIR BAGS - MOBILE 4 BOTTLE CASCADE
PORTABLE RADIO 6 39.18, 39.82, 39.50 - 1 HIGH BAND PORTABLE

COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
LEELANAU CO

1 AMBULANCE 1983 MODULINE

Dec 1991

SUTTONS BAY FIRE RESCUE

Suttons Bay Bingham Fire & Rescue

EQUIPMENT AVAILABLE FOR MUTUAL ASSISTANCE

FIRE DEPARTMENT: Suttons Bay Bingham TX NUMBER 66-2713580-3343
COUNTY: Leelanau CHIEF Dick Catton

ENGINES: MANUFACTURER - YEAR - PUMP CAPACITY - TANK H_2O CAPACITY
1: Chev - 87 - 1000 GPM - 1500 - 2100 Dump Tank
2: International - 72 - 750 GPM - 750
3: ____ - ____ - ____ - ____
4: GMC - 86 - Equipment - Van

WATER TENDERS: MANUFACTURER - YEAR - TANK H_2O CAPACITY - DROP TANK CAP
1: Ford - 78 - 2000 - 2100
2: Ford - 79 - 1300 - 2000
3: Ford - 76 - Grass Rig - 250 Gal Tank
4: Chev - 78 - Grass Rig - 200 Gal Tank

HOSE: NUMBER OF LENGTHS - THREAD
1" 300 FT - N.F.T.
1 1/2" 40 - 2000 FT - 1½
2" ____ - ____
2 1/2" 30 - 1500 FT - 2½
3" ____ - ____

LIST ANY OTHER HOSE BELOW
5" 450 FT.

HEAVY STREAM APPLIANCES: DELUGE SETS, TURRENT PIPE, MONITORS
LIST: 1 Elk Hart Brass 2½ Monitor Portable
2 - 2½ Inlet

FOAM EQUIPMENT: TYPE - AMOUNT - EDUCTORS: CAPACITY - NUMBER
Elk Hart - 2 - 90 GPM - ____

SCBA'S: TYPE - NUMBER - TANK CAPACITY - EXTRA TANKS
Scott - 10 - 30 min. - 8

PORTABLE PUMPS: MANUFACTURER - TYPE - NUMBER - CAPACITY
Hale - ____ - 2 - 350 GPM
Portable Hale - ____ - ____ - 2000 GPM
Trailer Mounted - ____ - ____ - ____

GROUND LADDERS: LENGTH - TYPE - NUMBER
35 - Ext - 1
24 - Ext - 2
12 - Roof - 2

SPECIAL EQUIPMENT: SUCH AS K12'S, GENERATORS, PORTA POWERS, SAWS, SMOKE EJECTORS, PROXIMITY SUITS, LIGHTING EQUIPMENT, ETC.
1 - K-12 Saw
1 - Chain Saw
2 - Generators
2 Smoke Ejectors
1 Heavy Duty Hurst Jaw + Cutters

COOPERATIVE MUTUAL AID AGREEMENTS: LIST DEPARTMENTS, AGENCIES.
All County Mutual Aid
Grand Traverse County Fire -

1 Ford Ambulance 84 -
1 Chev Ambulance 76 -

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